11

TC-277-4

E Model
US Model
Canadian Model
GEP Model

SONY
SONY
SOLID STATE STEREO TAPECORDER
TC-277-4

4-CHANNEL
STEREO TAPECORDER

SPECIFICATIONS

Power Requirements: AC 100, 110, 120, 127, 220, 240 V
50/60 Hz 30 W (General Export and GEP)
AC 120 V 60 Hz, 30 W (USA and Canada)

Track System: 4 track 4 channel stereo

Reel Size: 7" (18 cm) maximum

Tape Speed: 7½ ips (19 cm/s), 3¾ ips (9.5 cm/s), 1⅞ ips (4.8 cm/s)

Recording Time: (with 1,800 ft tape)

Tape Speed	4 track 4 channel	4 track 2 channel
7½ ips (19 cm/s)	45 minutes	1.5 hours
3¾ ips (9.5 cm/s)	1.5 hours	3 hours

Frequency Response: With SONY SLH tape
30～23,000 Hz – 15 dB (19 cm/s 7½ ips)
50～18,000 Hz ± 3 dB (19 cm/s 7½ ips)
30～16,000 Hz – 15 dB (9.5 cm/s 3¾ ips)
With standard tape
30～20,000 Hz – 15 dB (19 cm/s 7½ ips)
50～13,000 Hz ± 3 dB (19 cm/s 7½ ips)
30～13,000 Hz – 15 dB (9.5 cm/s 3¾ ips)

Signal-to-Noise Ratio: 55 dB or better (with SONY SLH tape)
52 dB or better (with standard tape)

Flutter and Wow: 0.12 % at 7½ ips (19 cm/s) WRMS

Recording Bias Frequency: Approx. 120 kHz

Inputs: Four MICROPHONE inputs
Impedance : low impedance
Maximum sensitivity : 0.2 mV (–72 dB)
Four LINE INputs
Impedance : 100 kΩ
Maximum sensitivity : 0.06 V (–22 dB)

Outputs: Four LINE OUTputs
Impedance : 10 kΩ
Output level : 0.775 V (0 dB) with 100 kΩ load
HEADPHONE outputs
Load impedance : 8 Ω
Output level : 30.8 mV (–28 dB)

Semiconductors: 29 transistors and 11 diodes

Dimensions: $15\frac{21}{32}$ (W) x $15\frac{7}{16}$ (H) x $7\frac{23}{32}$ (D)
(398 x 392 x 196 mm)

Weight: 23 lb 2 oz (10.5 kg)

SONY®
SERVICE MANUAL

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When ordering replacement parts, you should use PART NUMBER listed on the Parts List or shown in the EXPLODED VIEWS.
The reference number should not be used for ordering purposes.

SECTION 1

OUTLINE

1-1. ADAPTATION TO THE LOCAL POWER LINE FREQUENCY

(General Export and GEP)

	50 Hz LINE	60 Hz LINE
frequency change switch (See Fig. 1-1)	50 Hz position	60 Hz position
capstan sleeve (See Fig. 1-2)	Put it on capstan.	Put it on capstan sleeve support.

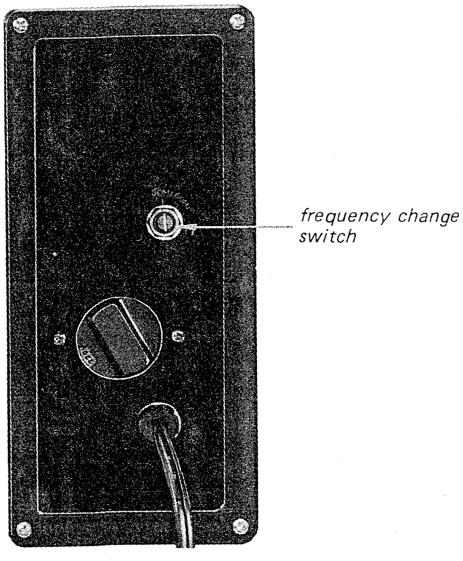

frequency change switch

Fig. 1-1. Frequency change switch

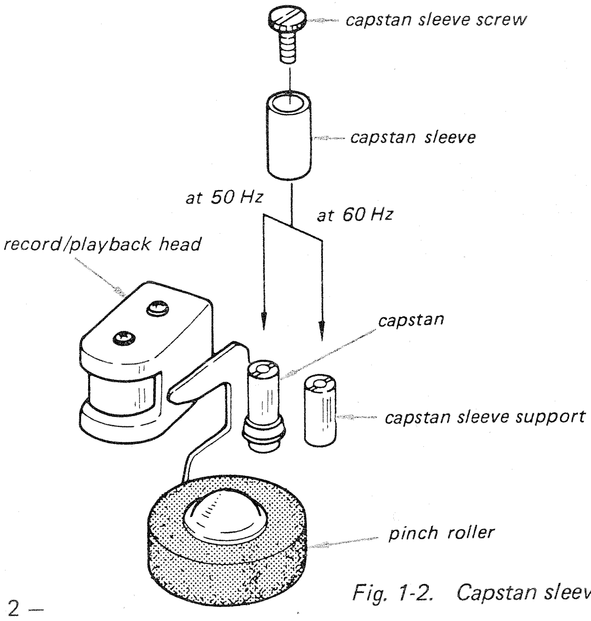
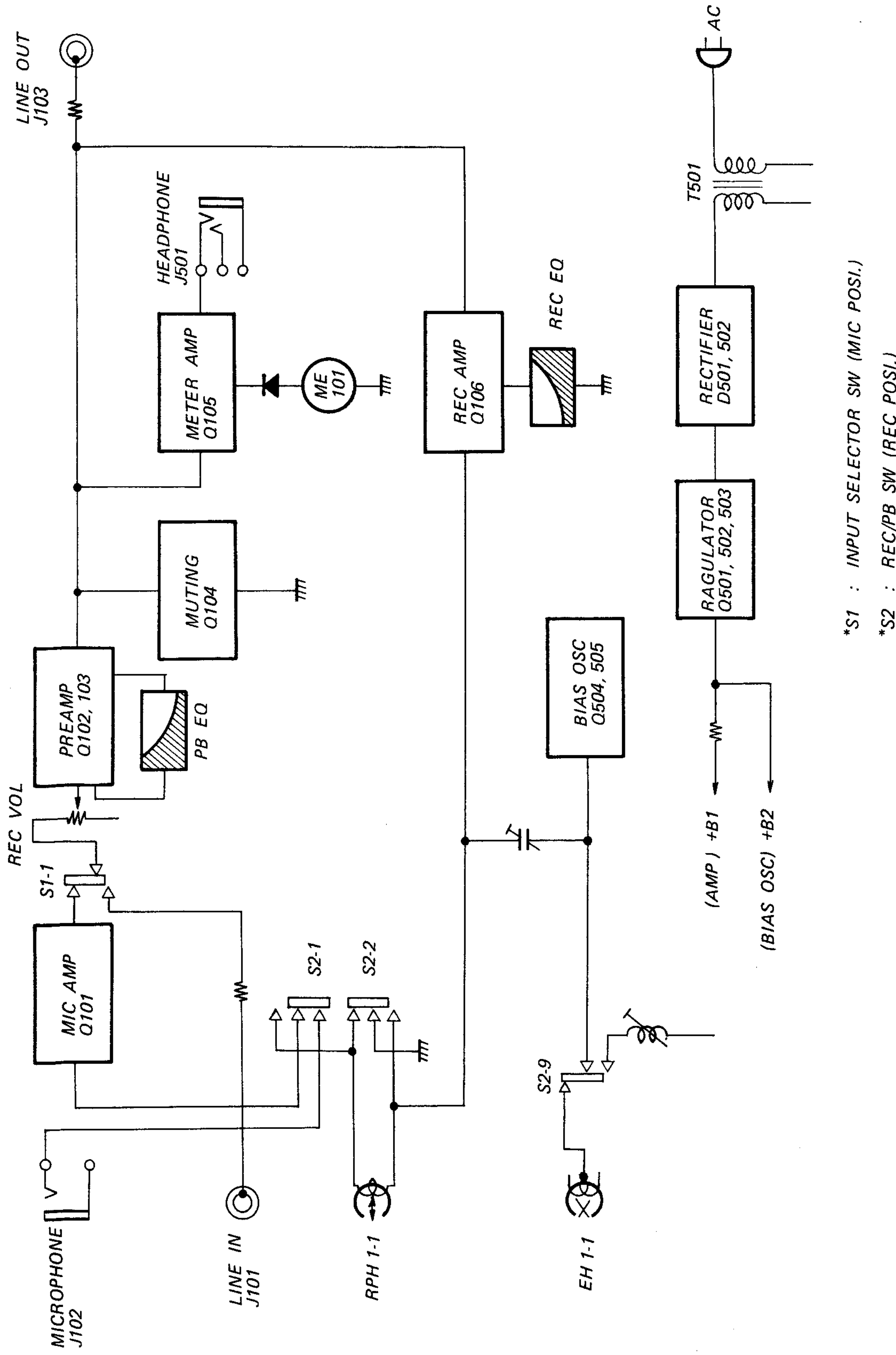

capstan sleeve screw
capstan sleeve
at 50 Hz
at 60 Hz
record/playback head
capstan
capstan sleeve support
pinch roller

Fig. 1-2. Capstan sleeve

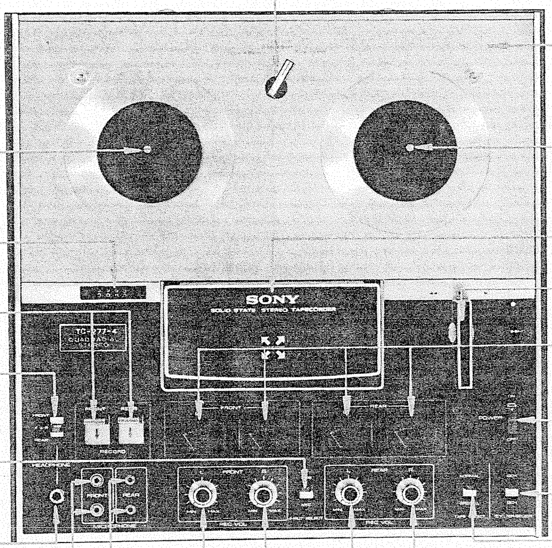
1-2. BLOCK DIAGRAM


LINE OUT
J103
HEADPHONE
J501
METER AMP
Q105
ME
101
MUTING
Q104
PREAMP
Q102, 103
PB EQ
REC VOL
S1-1
MIC AMP
Q101
S2-1
S2-2
MICROPHONE
J102
LINE IN
J101
RPH 1-1
REC AMP
Q106
REC EQ
BIAS OSC
Q504, 505
S2-9
EH 1-1
AC
T501
RECTIFIER
D501, 502
RAGULATOR
Q501, 502, 503
(AMP) +B1
(BIAS OSC) +B2
*S1 : INPUT SELECTOR SW (MIC POSI.)
*S2 : REC/PB SW (REC POSI.)

Note: This block diagram shows FRONT-L channel.
Other channels are identical.

1-3. MAJOR PARTS LOCATIONS

Cabinet — front view —


SONY
SOLID STATE STEREO TAPECORDER
TC-277-4
QUADRADIAL STEREO
FRONT
REAR
RECORD
HEADPHONE
POWER
REC VOL

X-34580-22
knob ass'y, speed selector

X-35100-08-5
panel ass'y, reel

X-35112-01
reel table ass'y, supply

X-35112-02
reel table ass'y, take-up

Y-20410-22-1
tape index counter, X-1

X-35100-09
head cover ass'y

3-510-069
knob, RECORD

X-34860-24
knob ass'y, function selector

1-514-869 (S8)
switch, slide; HEADPHONE

1-524-078 (ME101 ~ 401)
meter, level

1-514-814
switch, lever;
INPUT SELECT (S1)

1-514-642-21 (GEP)
1-514-655-31 (General Export)
1-514-655-71 (USA and Canada)
switch, seesaw; POWER (S14)

1-514-768
switch, lever; SYSTEM SELECT (S7)

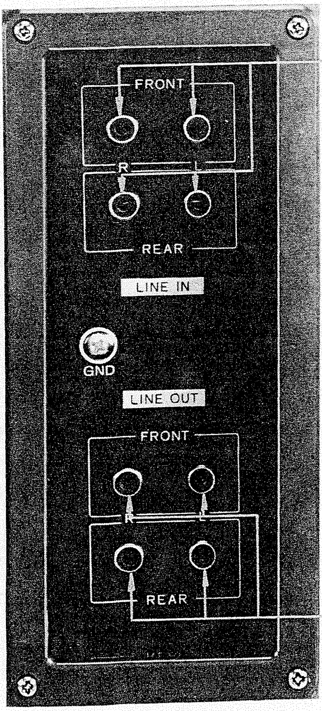
1-507-282 (J501)
jack, HEADPHONE

1-514-867
switch, lever; TAPE SELECT (S4)

1-507-251
jack, miniature; MICROPHONE
(J102 ~ J402)

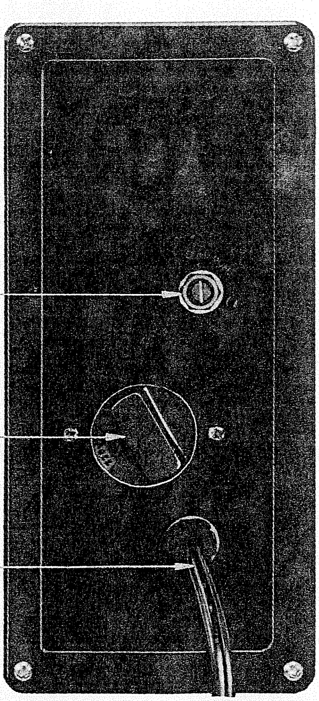
X-34980-02
knob ass'y, REC VOL

Jack Panel


FRONT
R
L
REAR
LINE IN
GND
LINE OUT
FRONT
R
L
REAR

1-507-163 (J101~ 401)
jack, 4 P-phono; LINE IN

1-507-163 (J103~ 403)
jack, 4 P-phono; LINE OUT

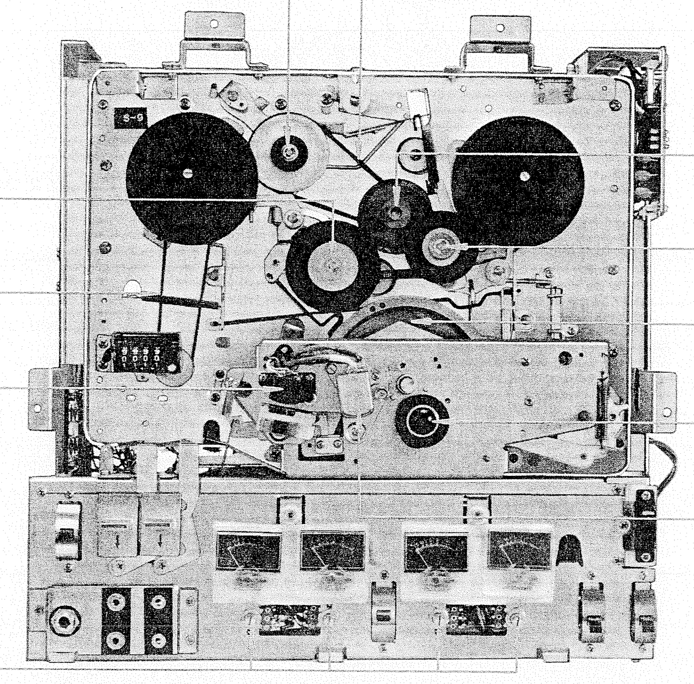


1-514-512 (S15)
switch, rotary;
frequency change
(General Export
and GEP)

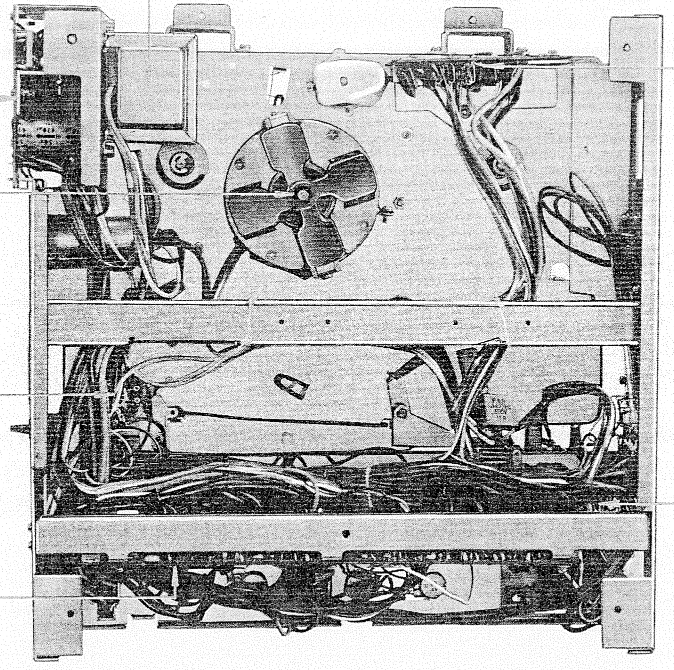
1-509-427 (General Export)
1-509-482 (GEP)
connector, power voltage selector (VS)

1-534-487 (General Export)
1-534-538-21 (USA and Canada)
cord, power

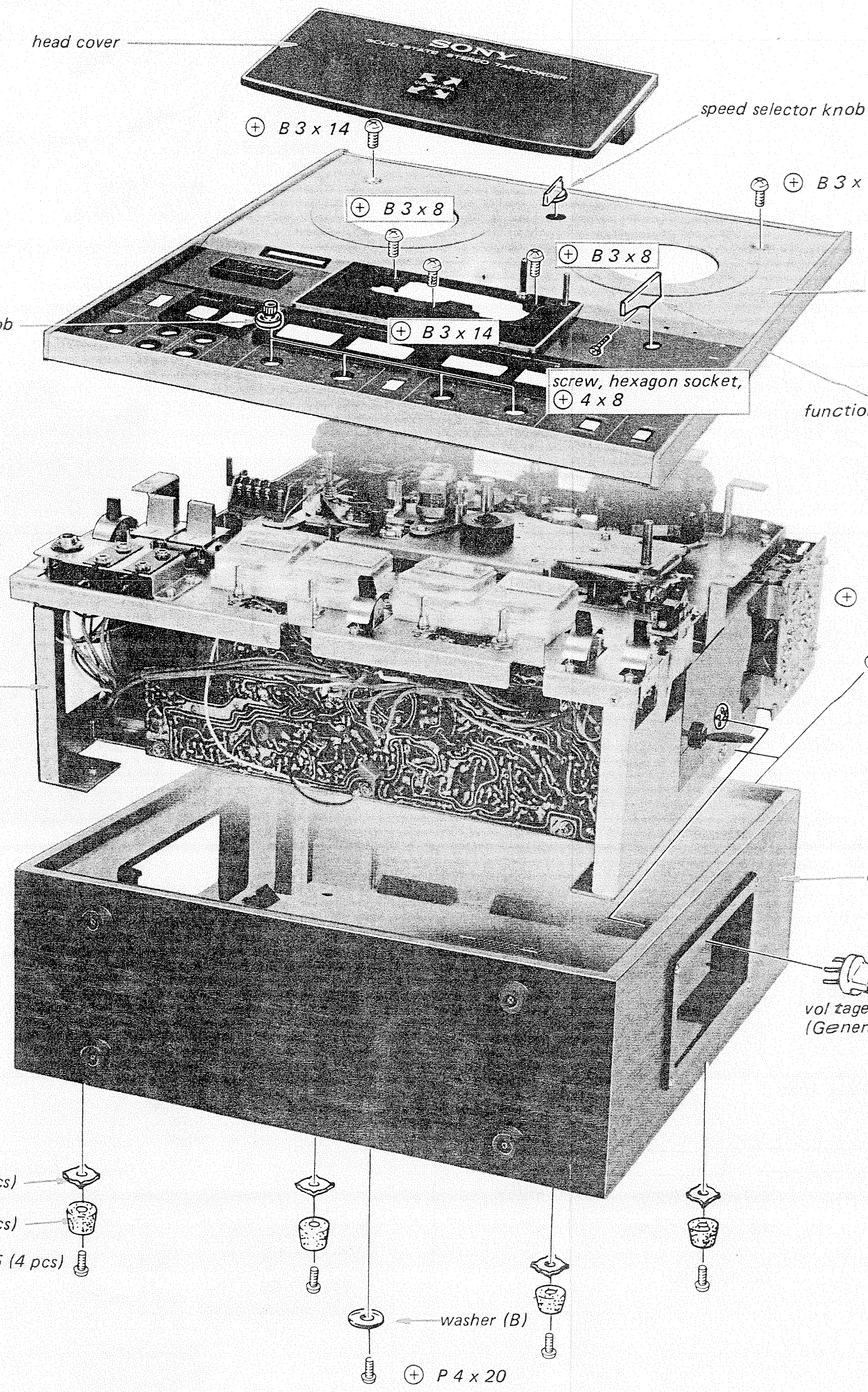
Chassis — front view —


X-34860-18
pulley ass'y, rewind
3-431-149
belt, rewind
X-34720-33
idler ass'y, capstan
3-458-116
belt, counter
8-825-527-00 (EH)
head, erase; EF137-2904H
1-222-306 (R141 ~ R441)
resistor, variable; 20 k (A)
REC VOL
3-511-101 (General Export, USA and Canada)
3-486-121 (GEP)
pulley, motor
X-34300-25
idler ass'y, take-up
X-35110-03
flywheel ass'y
3-421-086
pinch roller
8-829-342-40 (RPH)
head, record/playback;
PP138-4204

Chassis — back view —


1-441-924 (GEP)
1-441-877 (General Export)
1-441-829 (USA and Canada)
transformer, power (T501)
X-35100-52-2
mounted circuit board,
power supply & bias osc
8-832-624-22
motor, IC-624H
1-514-548
switch, rotary; bias osc (S12)
X-35100-51-1
mounted circuit board,
audio amp
X-35100-53
mounted circuit board,
equalizer switch
X-35100-54
mounted circuit board,
HEADPHONE switch

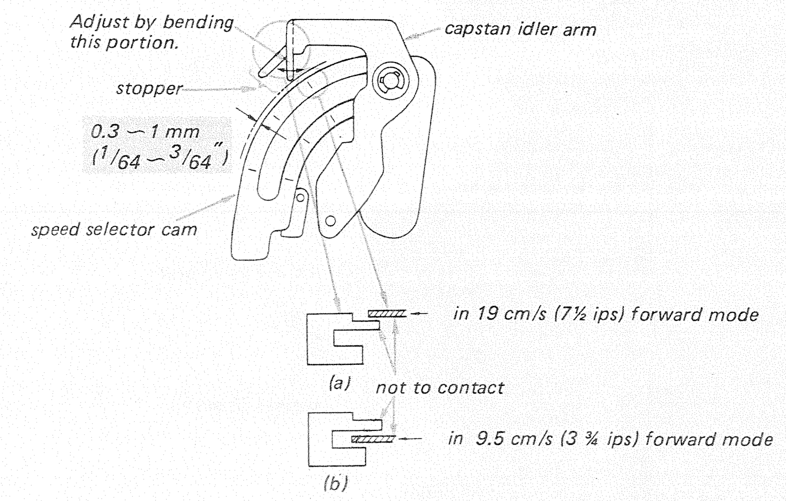
SECTION 2
DISASSEMBLY


head cover
⊕ B 3 x 14
speed selector knob
⊕ B 3 x 14
⊕ B 3 x 8
⊕ B 3 x 8
reel panel
REC VOL knob
⊕ B 3 x 14
screw, hexagon socket,
⊕ 4 x 8
function selector knob
⊕ RK 4 x 44 (2 pcs)
washer (2 pcs)
unit
cabinet
voltage selector knob
(General Export and GEP)
stopper, rubber foot (4 pcs)
foot, rubber (4 pcs)
⊕ P 4 x 25 (4 pcs)
washer (B)
⊕ P 4 x 20

SECTION 3
ADJUSTMENT PROCEDURES

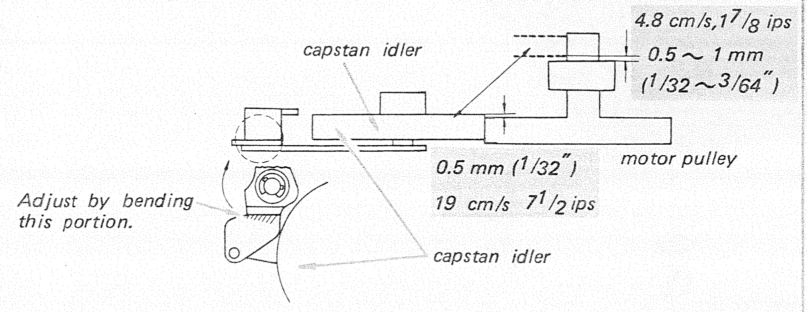
3-1. MECHANICAL ADJUSTMENTS

Capstan Idler Arm Stopper Adjustment

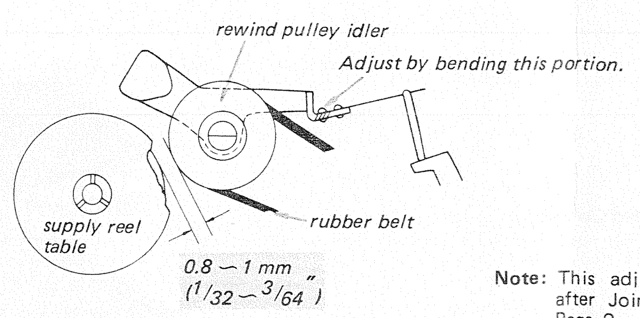

Adjust by bending this portion.
capstan idler arm
stopper
0.3 – 1 mm (1/64 – 3/64")
speed selector cam
in 19 cm/s (7½ ips) forward mode
(a)
not to contact
in 9.5 cm/s (3 ¾ ips) forward mode
(b)

In 4.8 cm/s ($1^7/_8$ ips) forward mode, idlers at the both sides of motor pulley should not contact.

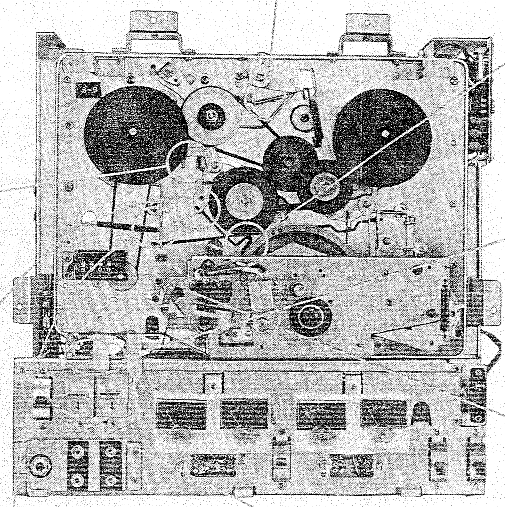
Capstan Idler Height Adjustment
– in Forward Mode –


4.8 cm/s, 1 7/8 ips
0.5 ~ 1 mm (1/32 ~ 3/64")
capstan idler
0.5 mm (1/32")
19 cm/s 7 1/2 ips
motor pulley
Adjust by bending this portion.
capstan idler

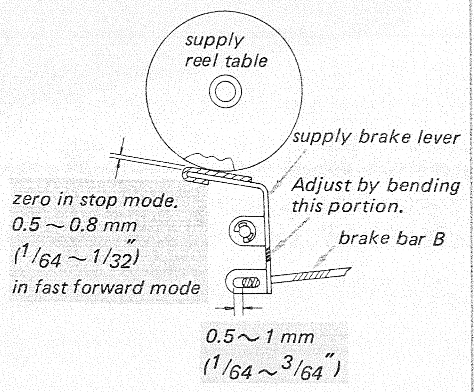
Rewind Pulley Adjustment
– in Stop Mode –


rewind pulley idler
Adjust by bending this portion.
supply reel table
rubber belt
0.8 – 1 mm (1/32 – 3/64")

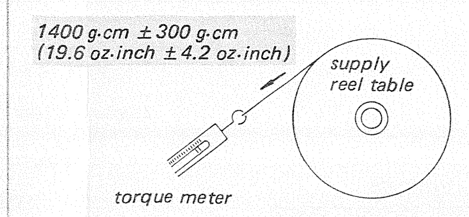
Note: This adjustment should be performed after Joint Lever Ass'y Adjustment on Page 9.



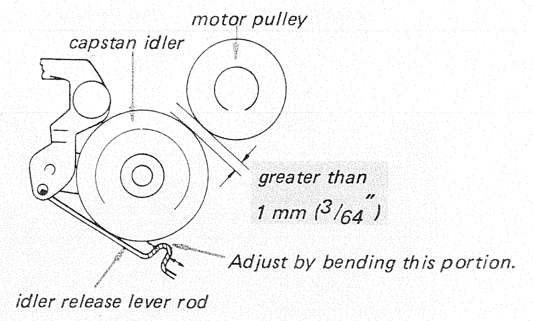
Brake (Supply) Adjustment
– in Stop Mode –


supply reel table
supply brake lever
Adjust by bending this portion.
zero in stop mode.
0.5 ~ 0.8 mm (1/64 ~ 1/32")
in fast forward mode
brake bar B
0.5 ~ 1 mm (1/64 ~ 3/64")

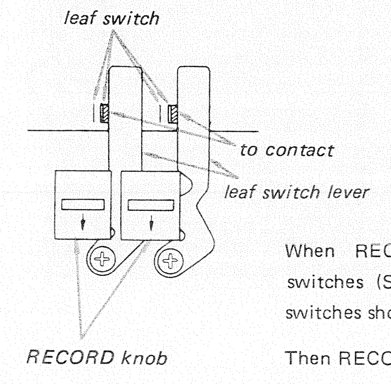
Brake Torque (Supply) Measurement
– in Stop Mode –


1400 g·cm ± 300 g·cm
(19.6 oz·inch ± 4.2 oz·inch)
supply reel table
torque meter

Capstan Idler and Motor Pulley Clearance Adjustment
– in 19 cm/s (7 ½ ips) Stop Mode –


motor pulley
capstan idler
greater than 1 mm (3/64")
Adjust by bending this portion.
idler release lever rod

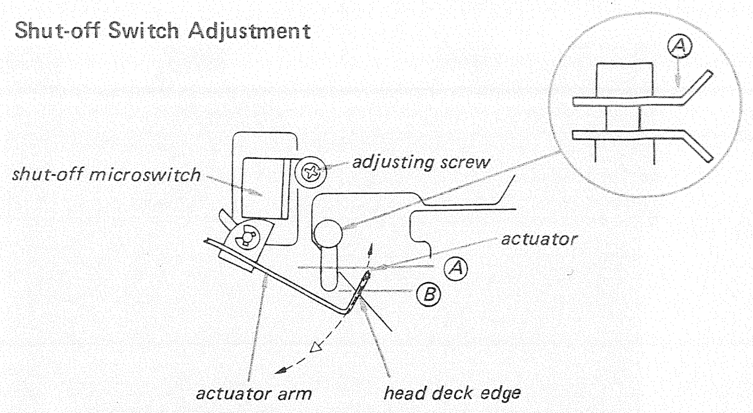
Leaf Switch Check


leaf switch
to contact
leaf switch lever
RECORD knob

When RECORD knobs are depressed, slide switches (S2, 3) should be changed and leaf switches should be turned on.

Then RECORD buttons are locked.

Shut-off Switch Adjustment


Ⓐ
shut-off microswitch
adjusting screw
actuator
Ⓐ
Ⓑ
actuator arm
head deck edge

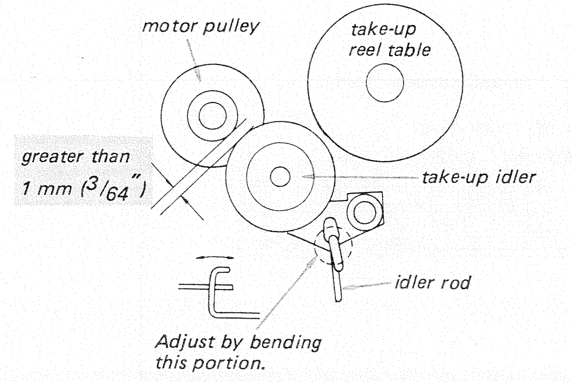
When actuator comes to the portion Ⓐ, shut-off microswitch should be turned ON.

When actuator comes to the portion Ⓑ, shut-off microswitch should be turned OFF.

If necessary, adjust the position of shut-off microswitch by adjusting screw.

Take-up Idler Ass'y Adjustment

– in Stop Mode –


motor pulley
take-up reel table
greater than 1 mm (3/64")
take-up idler
idler rod
Adjust by bending this portion.

Equalizer Switch Adjustment

1.
– In 4.8 cm/s, 1 7/8 ips tape speed –

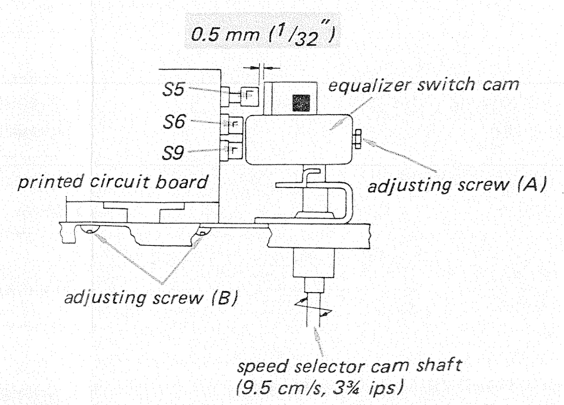
S5 : pushed
S6 : pushed
S9 : pushed

2.
– in 9.5 cm/s, 3 3/4 ips tape speed –

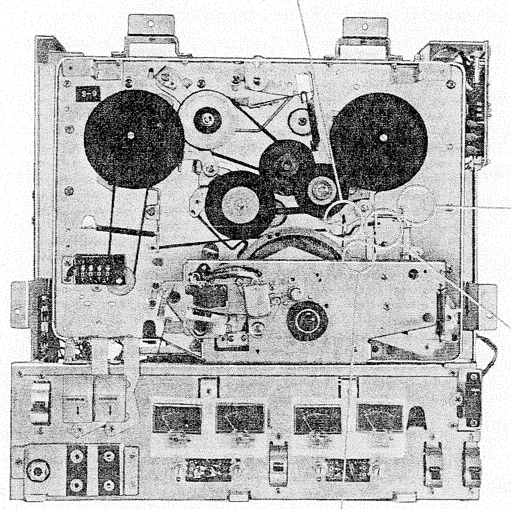
S5 : released
S6 : pushed
S9 : pushed

3.
– in 19 cm/s, 7 1/2 ips tape speed –

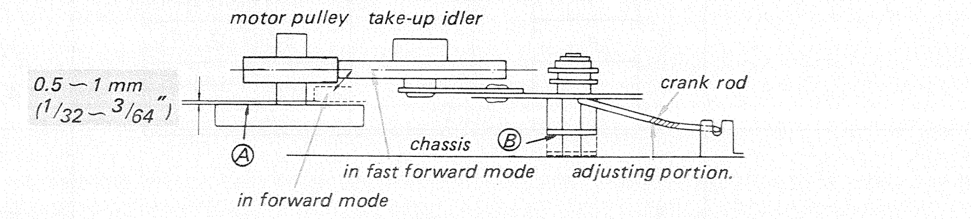
S5 : released
S6 : released
S9 : released


0.5 mm (1/32")
S5
S6
S9
equalizer switch cam
printed circuit board
adjusting screw (A)
adjusting screw (B)
speed selector cam shaft (9.5 cm/s, 3¾ ips)

If necessary, adjust by adjusting screws (A) and (B).



Take-up Idler and Motor Pulley Height Adjustment

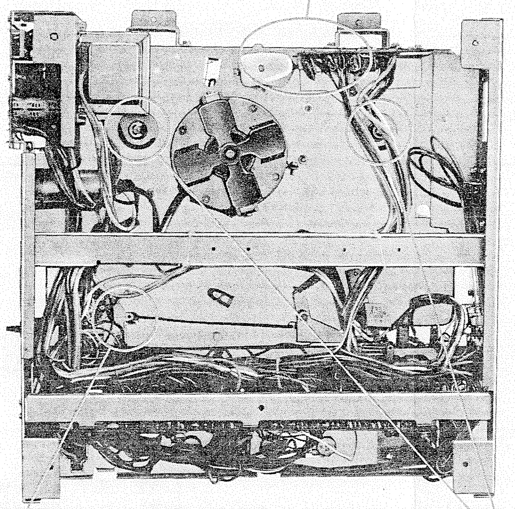

motor pulley
take-up idler
0.5 ~ 1 mm (1/32 ~ 3/64")
crank rod
Ⓐ
chassis
Ⓑ
in fast forward mode
adjusting portion.
in forward mode

In fast forward mode, take-up idler should contact the center of motor pulley as shown.

If necessary, adjust take-up idler height by bending adjusting portion.

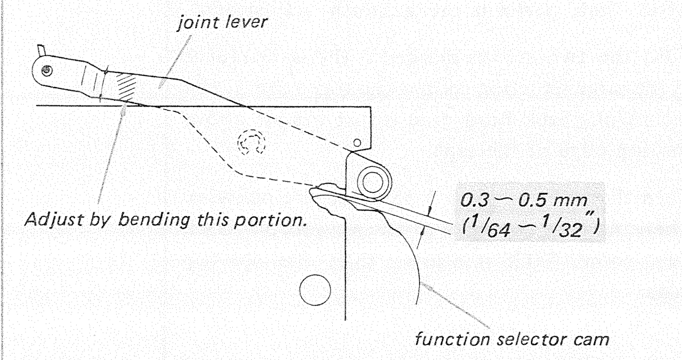
In forward mode, clearance between bottom of take-up idler and plain Ⓐ should be 0.5~1 mm (1/32 ~ 3/64"), and Ⓑ should contact chassis.

If necessary, adjust motor pulley height.



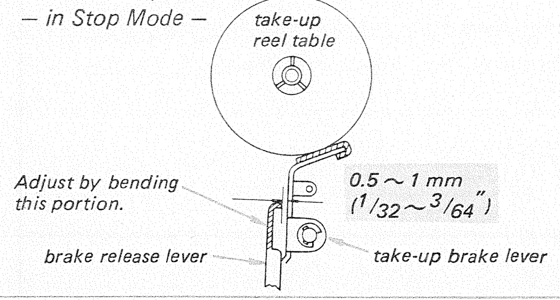
Joint Lever Ass'y Adjustment

– in Forward Mode –


joint lever
Adjust by bending this portion.
0.3 ~ 0.5 mm (1/64 ~ 1/32")
function selector cam

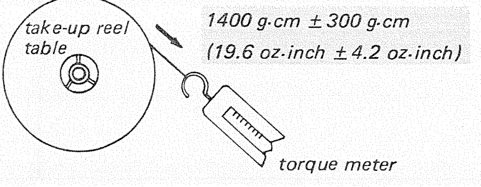
Brake (Take-up) Adjustment

– in Stop Mode –


take-up reel table
Adjust by bending this portion.
0.5 ~ 1 mm (1/32 ~ 3/64")
brake release lever
take-up brake lever

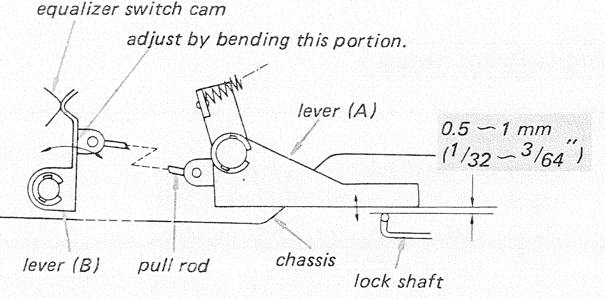
Brake Torque (Take-up) Measurement

– in Stop Mode –


take-up reel table
1400 g·cm ± 300 g·cm (19.6 oz-inch ± 4.2 oz-inch)
torque meter

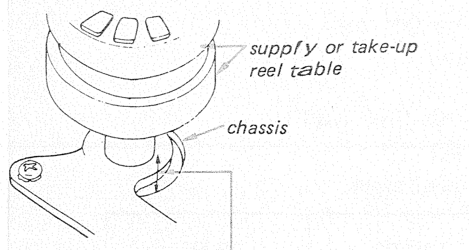
Record Mechanism Adjustment

– in Stop Mode –


equalizer switch cam
adjust by bending this portion.
lever (A)
0.5 ~ 1 mm (1/32 ~ 3/64")
lever (B)
pull rod
chassis
lock shaft

Check to see that except in the stop mode, RECORD knobs cannot be depressed and that if RECORD knobs are depressed one by one, the other depressed RECORD knob is released.

Reel Table Angle Adjustment


supply or take-up reel table
chassis

Adjust by bending this portion so that tape does not touch the reel fringes in fast forward, rewind and forward modes.

3-2. ELECTRICAL ADJUSTMENTS/MEASUREMENTS

Precautions:

1. Clean the following parts with alcohol moistened swab:

   record/playback head
   erase head
   capstan
   pinch roller
   rubber belts
   idlers

2. Demagnetize record/playback and erase heads with a head demagnetizer.
3. Do not use magnetized screwdrivers for the following adjustments.
4. Apply locking compound to the parts after the following adjustments.
5. Go through the adjustments in numerical order.
6. Adjustments and measurements should be performed for each channel.
7. 2-channel Stereo Recording.
   (1) Set SYSTEM SELECT switch to 2 CH.
   (2) Depress FRONT RECORD lever only.

Note: Do not depress REAR RECORD lever at this time, otherwise track 2 and 4 will be erased.

Equipment Required:

audio oscillator (af osc)
attenuator (att)
VTVM
1-kHz band-pass filter (BPF)
resistor 100 kΩ
SONY alignment tapes

TAPE / TONE	J-19-F2	J-9-F1
1	400 Hz (0 dB)	5 kH (−10 dB)
2	400 Hz (−10 dB)	400 Hz (0 dB)
3	10 Hz (−10 dB)	400 Hz (−10 dB)
4	12.5 kHz (−10 dB)	5 kHz (−10 Hz)
5	7 kHz (−10 dB)	3 kHz (−10 dB)
6	80 Hz (−10 dB)	160 Hz (−10 dB)
7	40 Hz (−10 dB)	80 Hz (−10 dB)

Normal Input Level

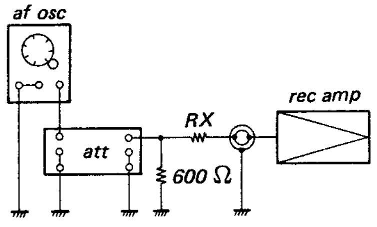
	MICROPHONE	LINE IN
signal source impedance	600 Ω	10 kΩ
input signal level	−60 dB (0.77 mV)	−10 dB (0.24 V)

Normal Output Level

	LINE OUT
load resistor	100 kΩ
output level	0 dB (0.775 V)

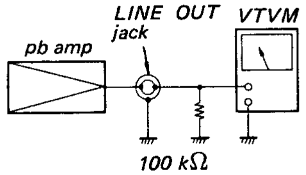
Equipment Connections:

Input Connection:



RX
MICROPHONE . . . 600 Ω
LINE IN. . . . . 10 kΩ

Output Connection:



Standard Control/Switch-Setting:

REC VOLUME Control:

After the playback output level adjustment and level meter calibration, set REC VOL control for 0 VU on level meter with normal input.

TAPE SELECT Switch:
NORMAL

TAPE SPEED Switch:
7½ 19 cm

SYSTEM SELECT Switch:
4 CH

unless otherwise indicated.

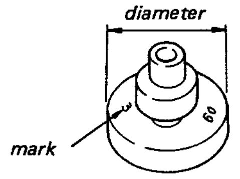
1. Tape Speed Adjustment (9.5 cm/s)

Procedure:

1. Connect a frequency counter to the LINE OUT jack.
2. Play back the SONY speed check tape SPC-47 (4 kHz) at 7½ ips (19 cm/s) tape speed in horizontal position.

Note: If the counter reading is out of the range between 3920 and 4080 Hz, replace the motor pulley.

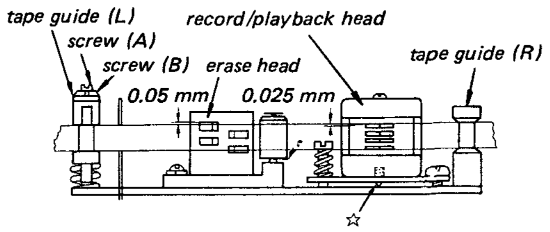
Motor Pulley		
Mark	**Diameter**	**Part No.**
2	bigger	3-511-101-01
3	↑	3-511-101-11
4		3-511-101-21
5	↓	3-511-101-31
6	smaller	3-511-101-41



2. Tape Path Adjustment

2-1. Tape Guide Adjustment

Setup:



Procedure:

1. Loosen the inner screw (A) of the tape guide L.
2. Adjust the outer screw (B) so that the top edge of the erase head core is just visible above the top edge of the tape.
3. Turn the outer screw (B) 35 degrees clockwise.
4. Fix the tape guide by turning the inner screw (A) clockwise. Then the core top edge comes 0.05 mm higher than the tape top edge.

2-2. Record/Playback Head Temporary Adjustment

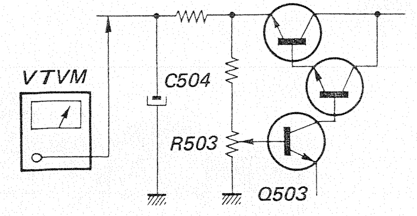
Note: 1. Repeat azimuth, zenith and height adjustments because these adjustments are related each other.
2. After this temporary adjustment, perform the electrical adjustments 4, 5 on Page 13.

Procedure:

1. Adjust by turning the two screws marked ☆ evenly so that the cores fit to the middle of tape width.
   After that, perform the azimuth adjustment.
2. Turn the two screws marked ☆ the same turns in the same direction so that the top edge of the record/playback head core is just visible above the top edge of the tape.
3. Turn the screw marked ☆ 15 degrees clockwise. Then the core top edge of the record/playback head comes 0.025 mm lower than the tape top edge.

3. Power Voltage Adjustment

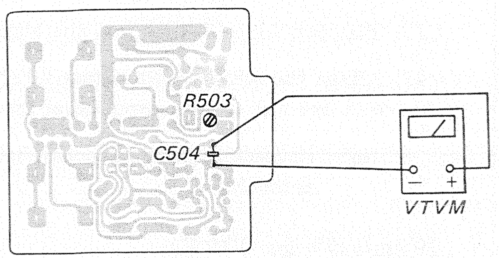
Setup:


VTVM
C504
R503
Q503

Procedure:

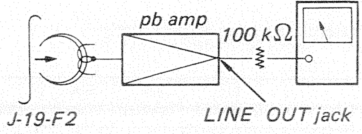
1. Use 120 V ac regulated power source.
2. Adjust semi-fixed resistor R503 so that voltage across capacitor C504 is 26 V ± 0.5 V on VTVM.

Adjusting Parts Location — *Conductor Side* —


R503
C504
VTVM
–
+

4. Record/Playback Head Zenith Adjustment

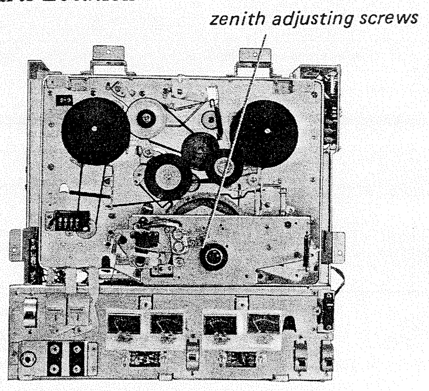
Setup:


VTVM
pb amp
100 kΩ
J-19-F2
LINE OUT jack

Procedure:

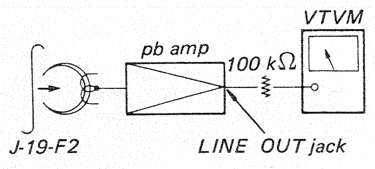
1. Play 4th tone (12.5 kHz) on SONY alignment tape J-19-F2.
2. Adjust the zenith adjusting screws for maximum VTVM reading.

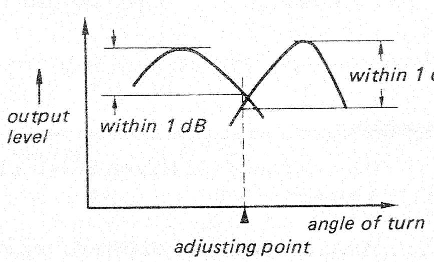
Adjusting Parts Location


zenith adjusting screws

5. Record/Playback Head Azimuth Adjustment

Setup:


VTVM
pb amp
100 kΩ
J-19-F2
LINE OUT jack



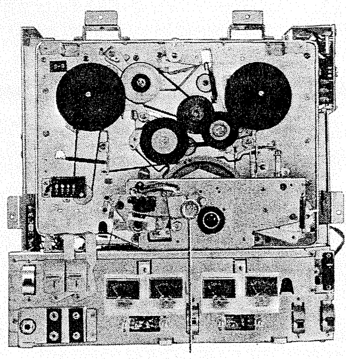
Procedure:

1. Play 4th tone (12.5 kHz) on SONY alignment tape J-19-F2.
2. Adjust the azimuth adjusting screw for the biggest peak VTVM reading.

Note: 1. If you turn the azimuth adjusting screw more than one turn, perform tape path adjustment (page 12) again.

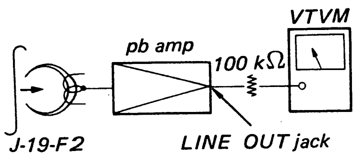
2. If you cannot obtain the biggest peak reading for each channel at one screw position, take the mid between the both extreme positions of the screw, and the difference between each extreme peak level and the adjusted output level should be within 1 dB difference. If the difference is more than 1 dB, perform record/playback head zenith adjustment. If you still cannot obtain desired result, change the record/playback head.

Adjusting Parts Location


azimuth adjusting screw

6. Playback Output Level Adjustment and Level Meter Calibration

Setup:


VTVM
pb amp
100 kΩ
J-19-F2
LINE OUT jack

Procedure:

1. Play 1st tone (400 Hz) on SONY alignment tape J-19-F2.
2. Adjust semi-fixed resistors R113, 213, 313, 413 for 0 dB (0.775 V) VTVM reading and then adjust semi-fixed resistors R131, 231, 331, 431 for 0 VU on the level meter.

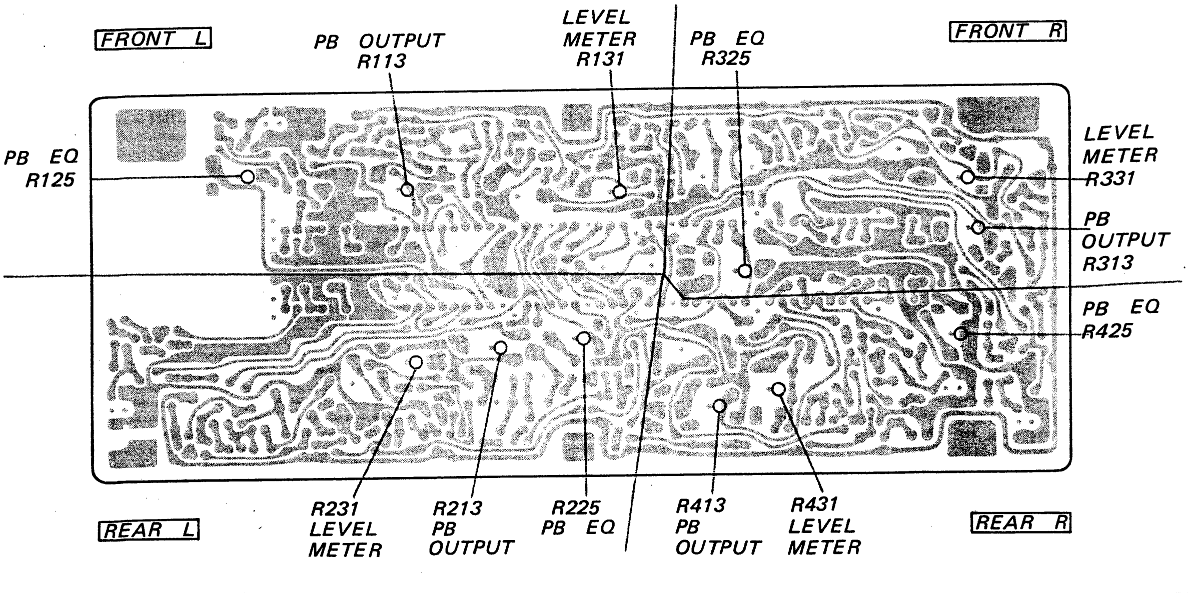
Note: 1. When changing the TAPE SELECT switch to SPECIAL, the LINE OUTput level will decrease as follows.

FRONT:	−1.3 dB ± 0.5 dB (0.6 ~ 0.7 V)
REAR:	−2.7 dB ± 0.5 dB (0.5 ~ 0.6 V)

2. When changing the SYSTEM SELECT switch to 2 CH, REAR level meters will not work.

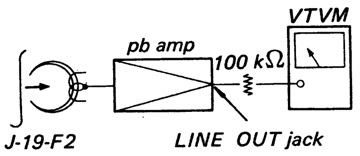
Adjusting Parts Location

– Conductor Side –


FRONT L
PB OUTPUT R113
LEVEL METER R131
PB EQ R325
FRONT R
PB EQ R125
LEVEL METER R331
PB OUTPUT R313
PB EQ R425
R231 LEVEL METER
R213 PB OUTPUT
R225 PB EQ
R413 PB OUTPUT
R431 LEVEL METER
REAR L
REAR R

7. Playback Equalizer Adjustment (19 cm/s 7½ ips)

Setup:


VTVM
pb amp
100 kΩ
J-19-F2
LINE OUT jack

Procedure:

1. Play 2nd tone (400 Hz) on SONY alignment tape J-19-F2.
2. Read the output level.
3. Play 3rd tone (10 kHz) on the alignment tape.
4. Adjust the semi-fixed resistors R125, 225, 325, 425 for the same output level as the step 2.

Note: Playback frequency response should be as follows:

19 cm/s (7½ ips) J-19-F2

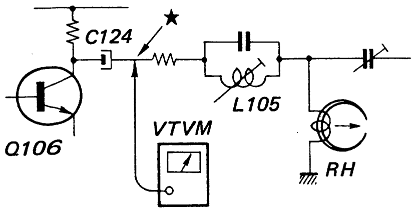
	2nd (400 Hz)	3rd (10 kHz)	4th (12.5 kHz)	5th (7 kHz)	6th (80 Hz)	7th (40 Hz)
output level	standard	0 dB	0 ± 2 dB		+2 ± 2 dB	+3 ± 2 dB

9.5 cm/s (3¾ ips) J-9-F1

	3rd (400 Hz)	4th (5 kHz)	5th (3 kHz)	6th (160 Hz)	7th (80 Hz)
output level	standard	0 ± 2 dB		+1 ± 2 dB	+ 1.5 ± 2 dB

8. Bias Trap Coil Adjustment (1)

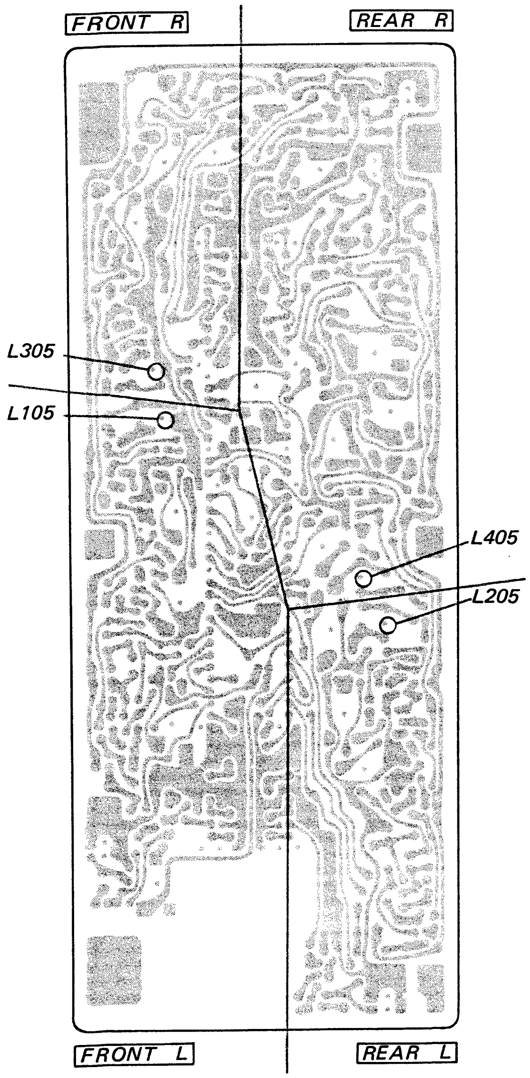
Setup:


C124
★
L105
VTVM
Q106
RH

Procedure:

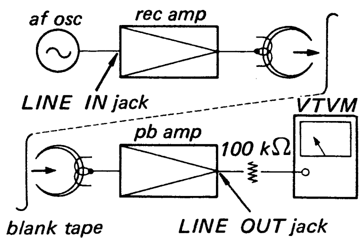
1. Place the unit in 4-channel record mode.
2. Turn REC VOL control fully counterclockwise (MIN).
3. Adjust bias trap coil so that the voltage of ★ position is minimum on VTVM.
4. Perform above adjustments for all channels.

Adjusting Parts Location *– Conductor Side –*


FRONT R
REAR R
L305
L105
L405
L205
FRONT L
REAR L

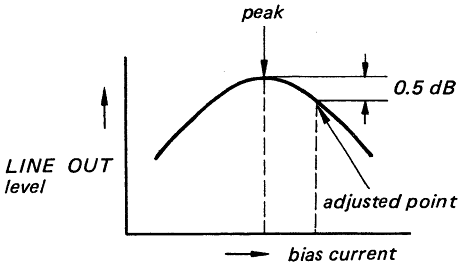
9. Recording Bias Adjustment

Setup:


af osc
rec amp
LINE IN jack
VTVM
pb amp
100 kΩ
blank tape
LINE OUT jack

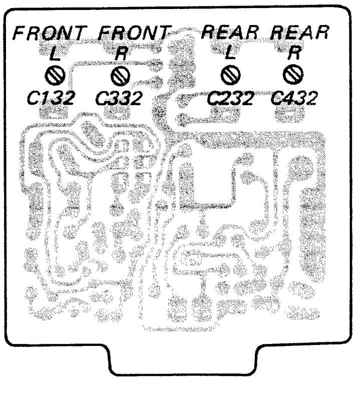
Procedure:

1. Set REC VOL control to standard setting (Page 11) and loosen the trimmer capacitor.
2. Record a 1 kHz signal of –10 dB (0.24 V) through LINE IN jack.
3. Play back the recorded signal.
4. Repeating Step 2 and Step 3, adjust by turning the trimmer capacitor clockwise for 0.5 dB below and beyond the maximum reading as shown below.



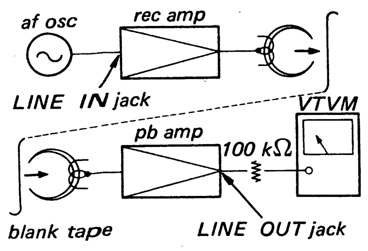
Adjusting Parts Location

– Conductor Side –


FRONT L
FRONT R
REAR L
REAR R
C132
C332
C232
C432

10. Dummy Coil Adjustment

Setup:

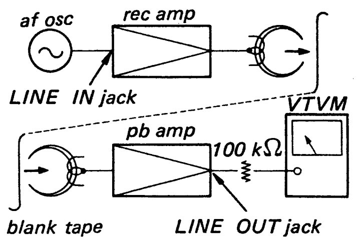

af osc
rec amp
LINE IN jack
VTVM
pb amp
100 kΩ
blank tape
LINE OUT jack

Procedure:

1. Record a 10 kHz signal of −20 dB (77 mV) through the LINE IN jack.
2. Playback the recorded signal.
3. Repeating Step 1 and Step 2, adjust REC VOL control so that each channel LINE OUT level is the same.
4. Set HEADPHONE switch to FRONT and change SYSTEM SELECT switch to 2 CH.
5. Adjust dummy coils L504 (L503) so that FRONT (REAR) LINE OUT level is the same as Step 3.

11. Record Level Adjustment

Setup:

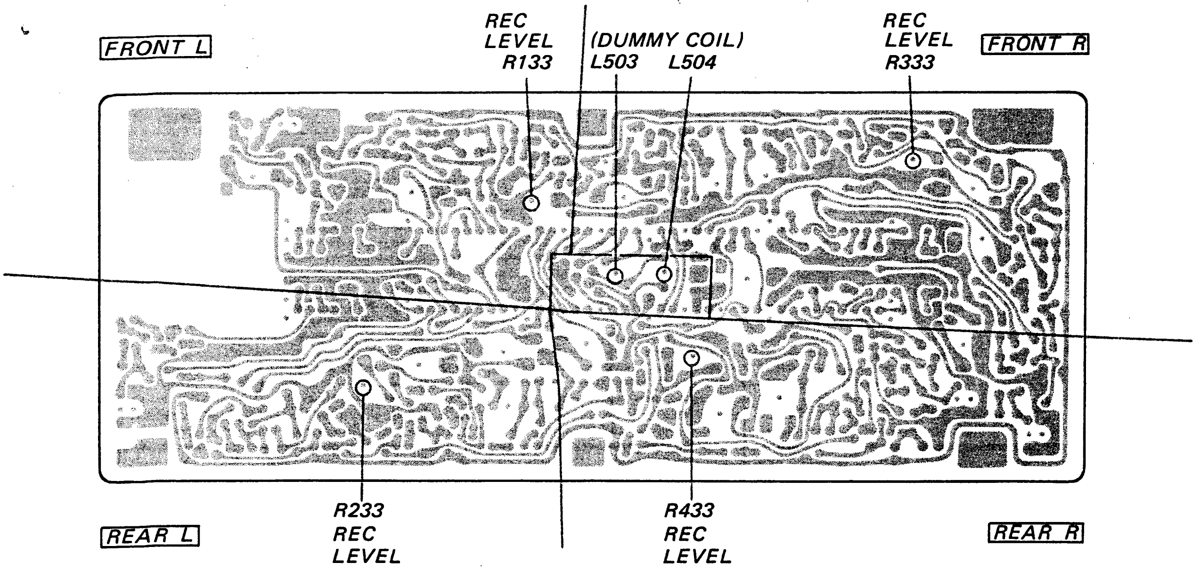

af osc
rec amp
LINE IN jack
VTVM
pb amp
100 kΩ
blank tape
LINE OUT jack

Procedure:

1. Record a 1 kHz of −10 dB (0.24 V) through the LINE IN jack.
2. Turn REC VOL control for 0 VU on the level meter.
3. Play back the recorded signal and read the output level.
4. Repeating Step 1 and Step 3, adjust the semi-fixed resistors R133, 233, 333, 433 for 0 dB (0.775 V) VTVM reading.

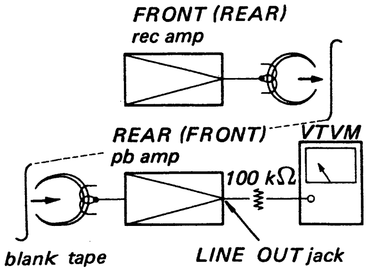
Adjusting Parts Location

– Conductor Side –


FRONT L
REC LEVEL R133
(DUMMY COIL)
L503 L504
REC LEVEL R333
FRONT R
REAR L
R233 REC LEVEL
R433 REC LEVEL
REAR R

12. Bias Trap Coil Adjustment (2)

Setup:

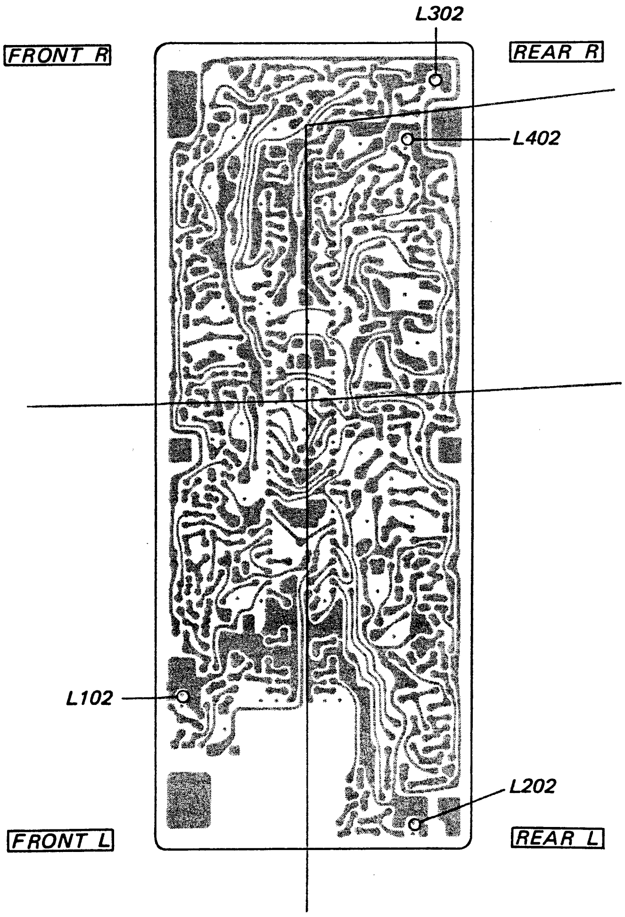

FRONT (REAR)
rec amp
REAR (FRONT)
pb amp
VTVM
100 kΩ
blank tape
LINE OUT jack

Procedure:

1. Turn all REC VOL controls fully clockwise (MAX).
2. Set REAR (FRONT) channels in record mode and FRONT (REAR) channels in playback mode.
3. Adjust bias trap coil L102, L302 (L202, L402) for minimum VTVM reading.

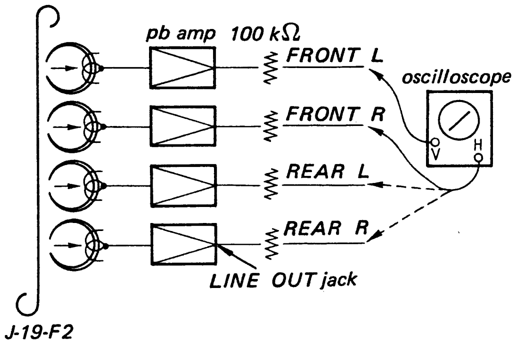
( ) : REAR channel.

Adjusting Parts Location *– Conductor Side –*


L302
FRONT R
REAR R
L402
L102
L202
FRONT L
REAR L

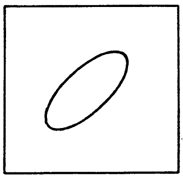
13. Phasing Measurement

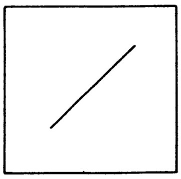
Setup:


pb amp
100 kΩ
FRONT L
oscilloscope
FRONT R
V
H
REAR L
REAR R
LINE OUT jack
J-19-F2

Procedure:

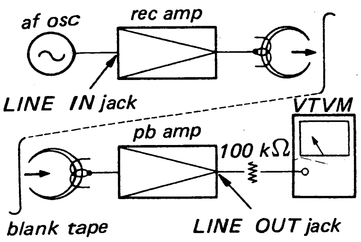
1. Playing 1st tone 400 Hz on SONY alignment tape J-19-F2, LINE OUTPUT level should be in phase on oscilloscope as shown in figure below.
2. Connecting oscilloscope to HEADPHONE jack, repeat Step 1.


out-of-phase


in-phase

14. Minimum Input Level Measurement

Setup:


af osc
rec amp
LINE IN jack
VTVM
pb amp
100 kΩ
blank tape
LINE OUT jack

Procedure:

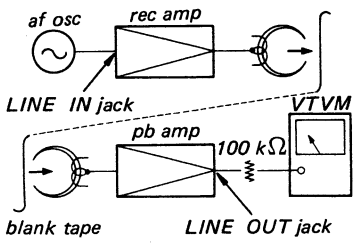
1. Turn REC VOL control fully clockwise (MAX).
2. Record a 1 kHz signal of −22 dB (62 mV) through the LINE IN jack.
3. Play back the recorded signal.
4. Measure the LINE OUTPUT level.

Specification:

greater than 0 dB (0.77 V)

15. Overall Frequency Response Measurement

Setup:


af osc
rec amp
LINE IN jack
VTVM
pb amp
100 kΩ
blank tape
LINE OUT jack

Procedure:

1. Set REC VOL control to standard setting (Page 11).
2. Record 50 Hz, 100 Hz, 1 kHz, 5 kHz, 7 kHz, 12.5 kHz and 18 kHz of −20 dB (77.5 mV) through the LINE IN jack.
3. Play back the signals and make sure that each deviation from the 1 kHz signal level is within the specified values.

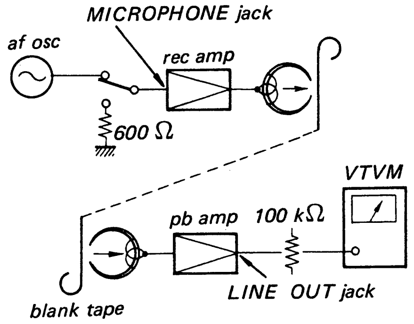
Specification (NORMAL, SPECIAL)

speed tone	7½ ips (19 cm/s)	3¾ ips (9.5 cm/s)
50 Hz	−4 ~ +2 dB	–
100 Hz	± 3 dB	± 3 dB
1 kHz	0 dB	0 dB
5 kHz	± 3 dB	± 3 dB
7 kHz	± 3 dB	± 3 dB
12.5 kHz	± 3 dB	–
18 kHz	−6 ~ +3 dB	–

Note: Use SLH tape for SPECIAL.

16. Overall S/N Ratio Measurement

Setup:


MICROPHONE jack
af osc
rec amp
600 Ω
VTVM
pb amp
100 kΩ
LINE OUT jack
blank tape

Procedure:

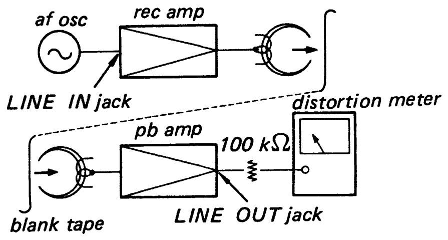
1. Record a 1 kHz signal of −60 dB (0.77 mV) through the MICROPHONE jack with REC VOL control set to 0 VU on the level meter.
2. Terminate the LINE IN jack with a 600 Ω resistor.
3. Continue recording with no input signal.
4. Play back the signal recorded portion and no signal recorded portion, and measure the output level difference between the two portions.

Specification:

greater than 46 dB

17. Overall Distortion Measurement

Setup:


af osc
rec amp
LINE IN jack
distortion meter
pb amp
100 kΩ
blank tape
LINE OUT jack

Procedure:

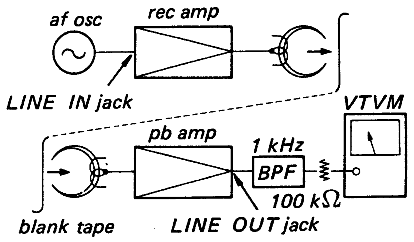
1. Record a 1 kHz signal of −10 dB (0.24 V) through the LINE IN jack with REC VOL control set to 0 VU on the level meter.
2. Play back the signal and measure distortion.

Specification:

less than 1.5 %

18. Erase Ratio Measurement

Setup:


af osc
rec amp
LINE IN jack
VTVM
pb amp
1 kHz
BPF
100 kΩ
blank tape
LINE OUT jack

Procedure:

1. Set REC VOL controls to standard setting (Page 11).
2. Record a 1 kHz signal of 0 dB (0.77 V) through the LINE IN jack in the 2-channel stereo record mode.
3. Rewind a half of recorded tape.
4. Disconnect the input connection and turn REC VOL controls fully counterclockwise.
5. Erase the tape by recording with no input signal.
6. Play back the signal recorded portion and the erased portion, and measure the output level difference between the two portions through a 1 kHz bandpass filter (BPF).

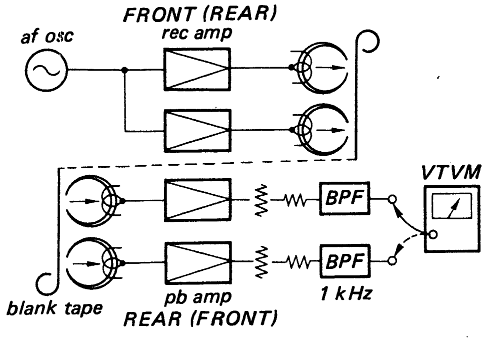
Specification:

greater than 65 dB

Note: This adjustment should be performed for FRONT channels and for REAR channels respectively.

19. Crosstalk Measurement (between channels)

Setup:


FRONT (REAR)
rec amp
af osc
VTVM
BPF
BPF
1 kHz
blank tape
pb amp
REAR (FRONT)

Procedure:

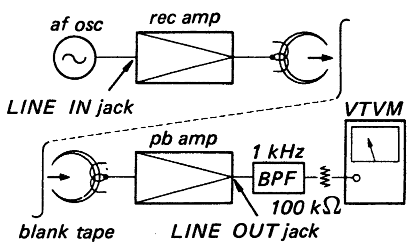
1. Set FRONT (REAR) REC VOL controls to standard setting (Page 11).
2. Place the unit in the 4-channel record mode.
3. Record a 1 kHz signal of 0 dB (0.77 V) through the FRONT (REAR) LINE IN jack.
4. Play back the tape and measure the level difference between REAR (FRONT) channel output level and FRONT (REAR) channel output level through a 1 kHz bandpass filter (BPF).

Specification:

greater than 45 dB

18. Erase Ratio Measurement

Setup:


af osc
rec amp
LINE IN jack
VTVM
pb amp
1 kHz
BPF
100 kΩ
blank tape
LINE OUT jack

Procedure:

1. Set REC VOL controls to standard setting (Page 11).
2. Record a 1 kHz signal of 0 dB (0.77 V) through the LINE IN jack in the 2-channel stereo record mode.
3. Rewind a half of recorded tape.
4. Disconnect the input connection and turn REC VOL controls fully counterclockwise.
5. Erase the tape by recording with no input signal.
6. Play back the signal recorded portion and the erased portion, and measure the output level difference between the two portions through a 1 kHz bandpass filter (BPF).

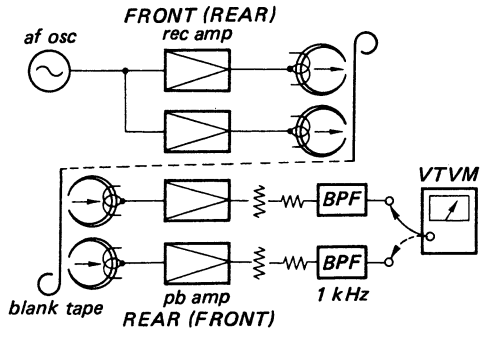
Specification:

greater than 65 dB

Note: This adjustment should be performed for FRONT channels and for REAR channels respectively.

19. Crosstalk Measurement (between channels)

Setup:


FRONT (REAR)
rec amp
af osc
VTVM
BPF
BPF
blank tape
pb amp
1 kHz
REAR (FRONT)

Procedure:

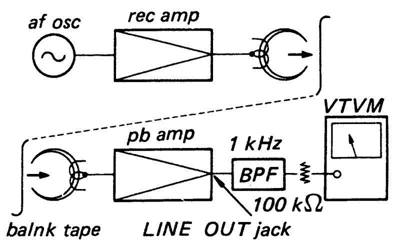
1. Set FRONT (REAR) REC VOL controls to standard setting (Page 11).
2. Place the unit in the 4-channel record mode.
3. Record a 1 kHz signal of 0 dB (0.77 V) through the FRONT (REAR) LINE IN jack.
4. Play back the tape and measure the level difference between REAR (FRONT) channel output level and FRONT (REAR) channel output level through a 1 kHz bandpass filter (BPF).

Specification:

greater than 45 dB

19. Crosstalk Measurement (between tracks)

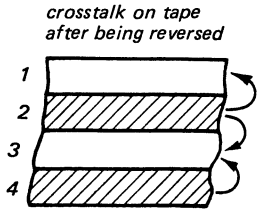
Setup:


af osc
rec amp
VTVM
pb amp
1 kHz
BPF
100 kΩ
balnk tape
LINE OUT jack

Procedure:

1. Set FRONT REC VOL controls to standard setting. (Page 11).
2. Turn REAR REC VOL controls fully counter-clockwise (MIN).
3. Record a 1 kHz signal of 0 dB (0.77 V) through the FRONT LINE IN jack in the 2-channel stereo record mode.
4. Play back the signal and note the VTVM reading.
5. Reverse tape threading and play back the opposite and adjacent tracks of the recorded tape.
6. Note the VTVM reading.
7. Measure the level difference between Step 4 and Step 6.

Specification: greater than 50 dB


crosstalk on tape after being reversed
1
2
3
4

21. Wow (Flutter) Measurement

Switch Settings

TAPE SELECT Switch : NORMAL
MONITOR Switch : TAPE

at 7½ ips (19 cm/s) and 3¾ ips (9.5 cm/s)

Measure the wow (flutter) at the tape end in both vertical and horizontal set positions.

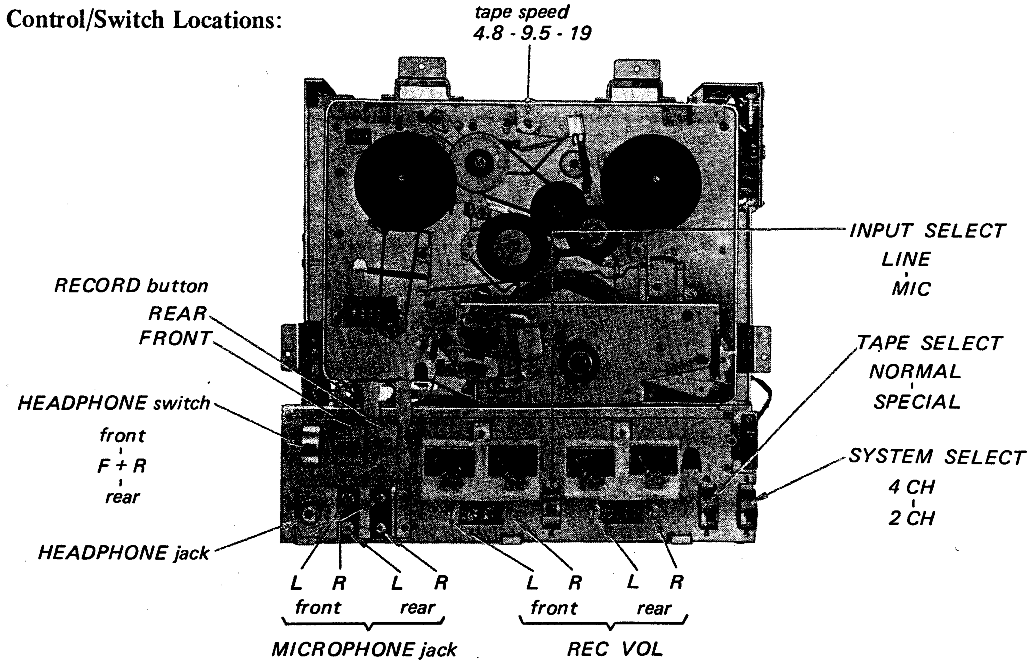
7 ½ ips (19 cm/s) : Play back the tape WS-19-7.
3 ¾ ips (9.5 cm/s) : Play back the tape WS-9-7.

at 1 ⅞ ips (4.8 cm/s)

Deliver a 3 kHz signal of –60 dB (0.775 mV) to the MICROPHONE jack, record the signal on a SONY blank tape "super 150" at the end approx. five minutes and read the wow meter.

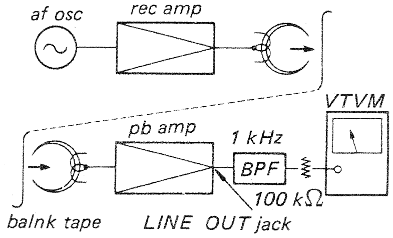
	Tape Speed	Wow (Flutter)
in both horizontal or vertical position	7 ½ ips (19 cm/s)	0.19 % RMS
	3 ¾ ips (9.5 cm/s)	0.24 % RMS
	1 ⅞ ips (4.8 cm/s)	0.3 % RMS

Control/Switch Locations:


tape speed
4.8 - 9.5 - 19
INPUT SELECT
LINE
MIC
RECORD button
REAR
FRONT
TAPE SELECT
NORMAL
SPECIAL
HEADPHONE switch
front
F + R
rear
SYSTEM SELECT
4 CH
2 CH
HEADPHONE jack
L R L R
front rear
MICROPHONE jack
L R L R
front rear
REC VOL

19. Crosstalk Measurement (between tracks)

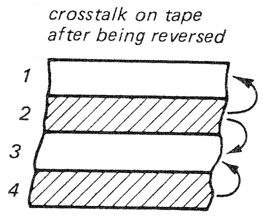
Setup:


af osc
rec amp
VTVM
pb amp
1 kHz
BPF
100 kΩ
balnk tape
LINE OUT jack

Procedure:

1. Set FRONT REC VOL controls to standard setting. (Page 11).
2. Turn REAR REC VOL controls fully counter-clockwise (MIN).
3. Record a 1 kHz signal of 0 dB (0.77 V) through the FRONT LINE IN jack in the 2-channel stereo record mode.
4. Play back the signal and note the VTVM reading.
5. Reverse tape threading and play back the opposite and adjacent tracks of the recorded tape.
6. Note the VTVM reading.
7. Measure the level difference between Step 4 and Step 6.

Specification: greater than 50 dB


crosstalk on tape
after being reversed
1
2
3
4

21. Wow (Flutter) Measurement

Switch Settings

TAPE SELECT Switch : NORMAL
MONITOR Switch : TAPE

at 7½ ips (19 cm/s) and 3¾ ips (9.5 cm/s)

Measure the wow (flutter) at the tape end in both vertical and horizontal set positions.

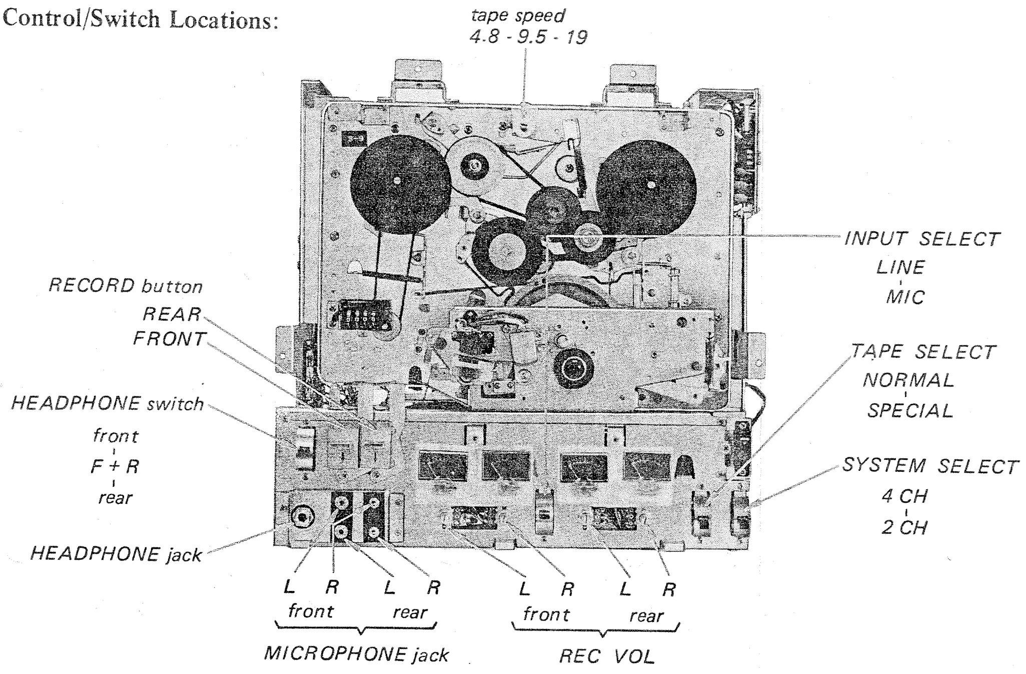
7 ½ ips (19 cm/s) : Play back the tape WS-19-7.
3 ¾ ips (9.5 cm/s) : Play back the tape WS-9-7.

at 1 ⅞ ips (4.8 cm/s)

Deliver a 3 kHz signal of –60 dB (0.775 mV) to the MICROPHONE jack, record the signal on a SONY blank tape "super 150" at the end approx. five minutes and read the wow meter.

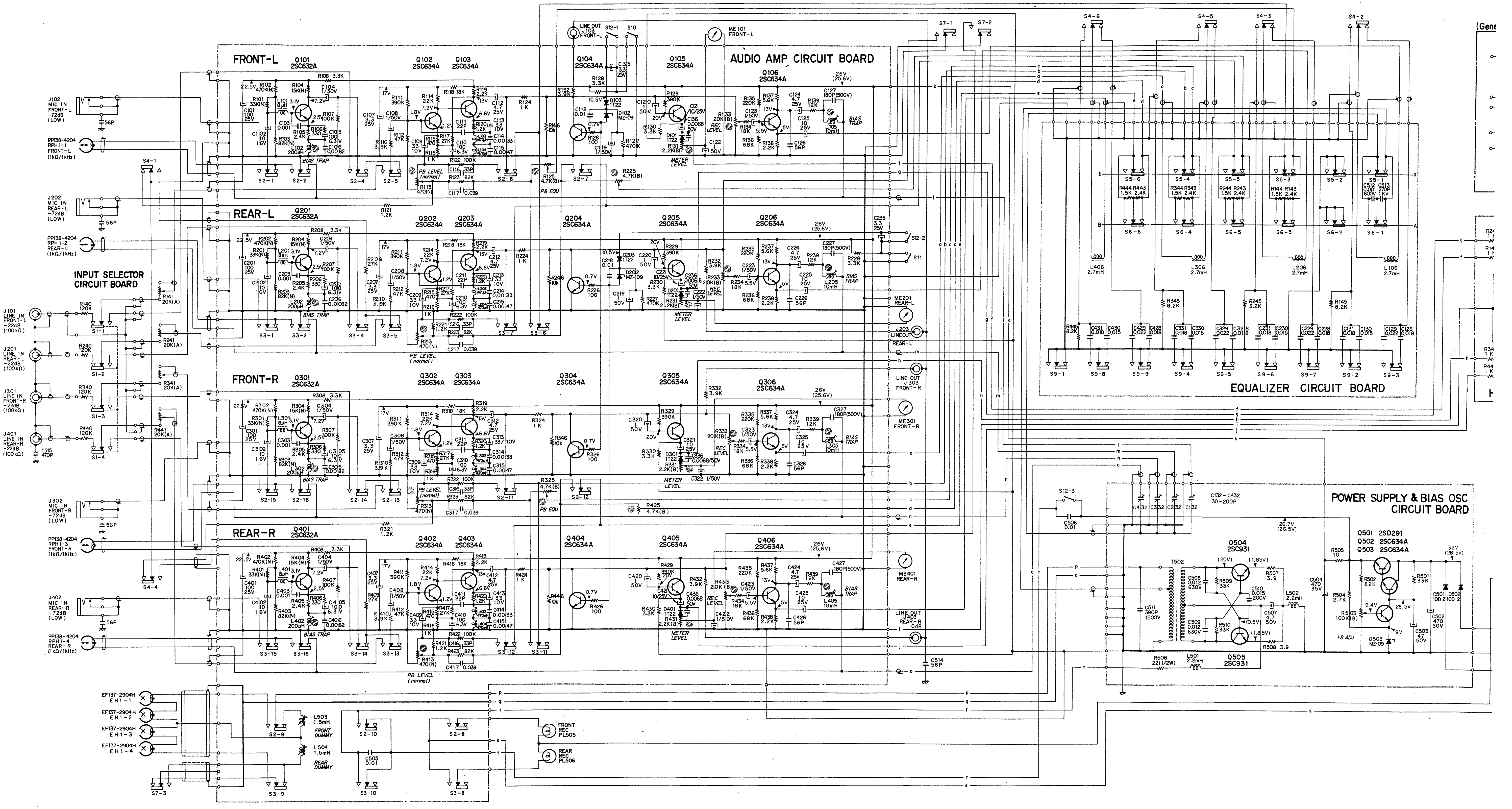
	Tape Speed	Wow (Flutter)
in both horizontal or vertical position	7 ½ ips (19 cm/s)	0.19 % RMS
	3 ¾ ips (9.5 cm/s)	0.24 % RMS
	1 ⅞ ips (4.8 cm/s)	0.3 % RMS

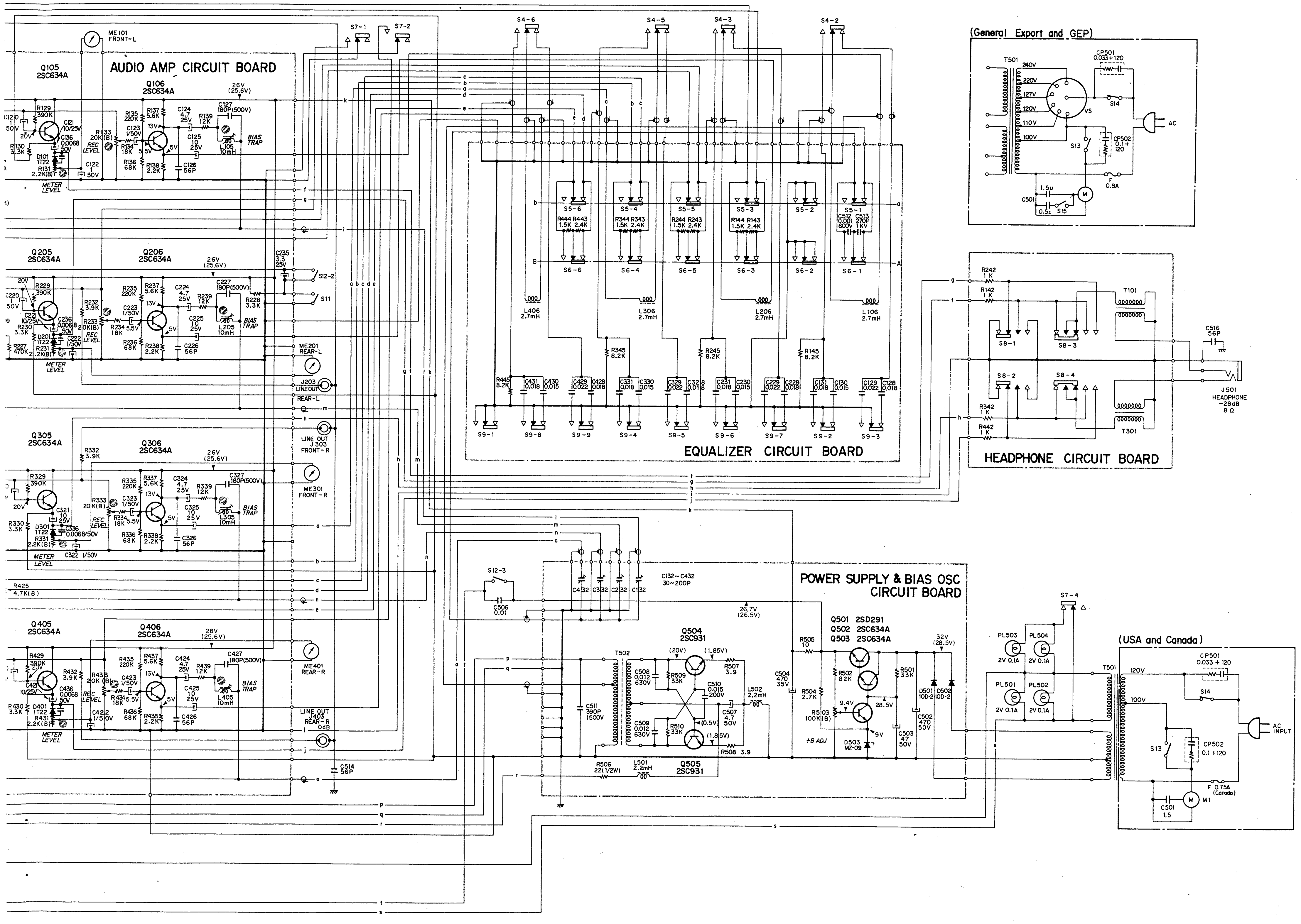
Control/Switch Locations:


tape speed
4.8 - 9.5 - 19
INPUT SELECT
LINE
MIC
RECORD button
REAR
FRONT
TAPE SELECT
NORMAL
SPECIAL
HEADPHONE switch
front
F + R
rear
SYSTEM SELECT
4 CH
2 CH
HEADPHONE jack
L R L R
front rear
MICROPHONE jack
L R L R
front rear
REC VOL

SECTION 4
DIAGRAMS

4-1. SCHEMATIC DIAGRAM


FRONT-L
REAR-L
FRONT-R
REAR-R
AUDIO AMP CIRCUIT BOARD
INPUT SELECTOR CIRCUIT BOARD
EQUALIZER CIRCUIT BOARD
POWER SUPPLY & BIAS OSC CIRCUIT BOARD
Q101 2SC632A
Q102 2SC634A
Q103 2SC634A
Q104 2SC634A
Q105 2SC634A
Q106 2SC634A
Q201 2SC632A
Q202 2SC634A
Q203 2SC634A
Q204 2SC634A
Q205 2SC634A
Q206 2SC634A
Q301 2SC632A
Q302 2SC634A
Q303 2SC634A
Q304 2SC634A
Q305 2SC634A
Q306 2SC634A
Q401 2SC632A
Q402 2SC634A
Q403 2SC634A
Q404 2SC634A
Q405 2SC634A
Q406 2SC634A
Q504 2SC931
Q505 2SC931
Q501 2SD291
Q502 2SC634A
Q503 2SC634A
J102 MIC IN FRONT-L -72dB (LOW)
PP138-4204 RPH1-1 FRONT-L (1kΩ/1kHz)
J202 MIC IN REAR-L -72dB (LOW)
PP138-4204 RPH1-2 REAR-L (1kΩ/1kHz)
J101 LINE IN FRONT-L -22dB (100kΩ)
J201 LINE IN REAR-L -22dB (100kΩ)
J301 LINE IN FRONT-R -22dB (100kΩ)
J401 LINE IN REAR-R -22dB (100kΩ)
J302 MIC IN FRONT-R -72dB (LOW)
PP138-4204 RPH1-3 FRONT-R (1kΩ/1kHz)
J402 MIC IN REAR-R -72dB (LOW)
PP138-4204 RPH1-4 REAR-R (1kΩ/1kHz)
LINE OUT J103 FRONT-L
J203 LINE OUT REAR-L
LINE OUT J303 FRONT-R
LINE OUT J403 REAR-R 0dB
ME101 FRONT-L
ME201 REAR-L
ME301 FRONT-R
ME401 REAR-R
BIAS TRAP
PB LEVEL (normal)
PB EQU
REC LEVEL
METER LEVEL
EF137-2904H EH1-1
EF137-2904H EH1-2
EF137-2904H EH1-3
EF137-2904H EH1-4
L503 1.5mH FRONT DUMMY
L504 1.5mH REAR DUMMY
FRONT REC PL505
REAR REC PL506
C132~C432 30~200P
T502
+B ADJ
D503 MZ-09
26V (25.6V)
26.7V (26.5V)
32V (28.5V)
S4-1
S4-2
S4-3
S4-4
S4-5
S4-6
S7-1
S7-2
S7-3
S12-1
S12-2
S12-3
S10
S11
(Gene


AUDIO AMP CIRCUIT BOARD
ME101 FRONT-L
Q105 2SC634A
Q106 2SC634A
Q205 2SC634A
Q206 2SC634A
Q305 2SC634A
Q306 2SC634A
Q405 2SC634A
Q406 2SC634A
METER LEVEL
REC LEVEL
BIAS TRAP
26V (25.6V)
ME201 REAR-L
J203 LINE OUT REAR-L
LINE OUT J303 FRONT-R
ME301 FRONT-R
ME401 REAR-R
LINE OUT J403 REAR-R 0dB
C514 56P
S7-1
S7-2
S12-2
S11
S4-6
S4-5
S4-3
S4-2
S5-6
S5-4
S5-5
S5-3
S5-2
S5-1
S6-6
S6-4
S6-5
S6-3
S6-2
S6-1
L406 2.7mH
L306 2.7mH
L206 2.7mH
L106 2.7mH
S9-1
S9-8
S9-9
S9-4
S9-5
S9-6
S9-7
S9-2
S9-3
EQUALIZER CIRCUIT BOARD
(General Export and GEP)
T501
240V
220V
127V
120V
110V
100V
VS
S14
S13
CP501 0.033+120
CP502 0.1+120
AC
F 0.8A
C501
HEADPHONE CIRCUIT BOARD
T101
T301
S8-1
S8-3
S8-2
S8-4
C516 56P
J501 HEADPHONE -28dB 8Ω
S12-3
C506 0.01
C132~C432 30~200P
POWER SUPPLY & BIAS OSC CIRCUIT BOARD
Q504 2SC931
Q505 2SC931
Q501 2SD291
Q502 2SC634A
Q503 2SC634A
T502
L501 2.2mH
L502 2.2mH
D503 MZ-09
+B ADJ
32V (28.5V)
26.7V (26.5V)
S7-4
PL503
PL504
PL501
PL502
2V 0.1A
(USA and Canada)
T501
120V
100V
CP501 0.033 + 120
S14
S13
CP502 0.1+120
AC INPUT
F 0.75A (Canada)
C501 1.5
M1

Note:

1. Switch Position is as follows:

S1 – 1 ~ 4 . . . INPUT SELECT (LINE POSITION)
S2 – 1 ~ 16 . . FRONT REC/PB (PB POSITION)
S3 – 1 ~ 16 . . REAR REC/PB (PB POSITION)
S4 – 1 ~ 6 . . . TAPE SELECT (NORMAL POSITION)
S5 – 1 ~ 6 . . . PB EQUALIZER BIAS (19 cm/s
S6 – 1 ~ 6 . . . POSITION)

S5	S6	SPEED
a	A	19 cm
b	A	9.5 cm
b	B	4.8 cm

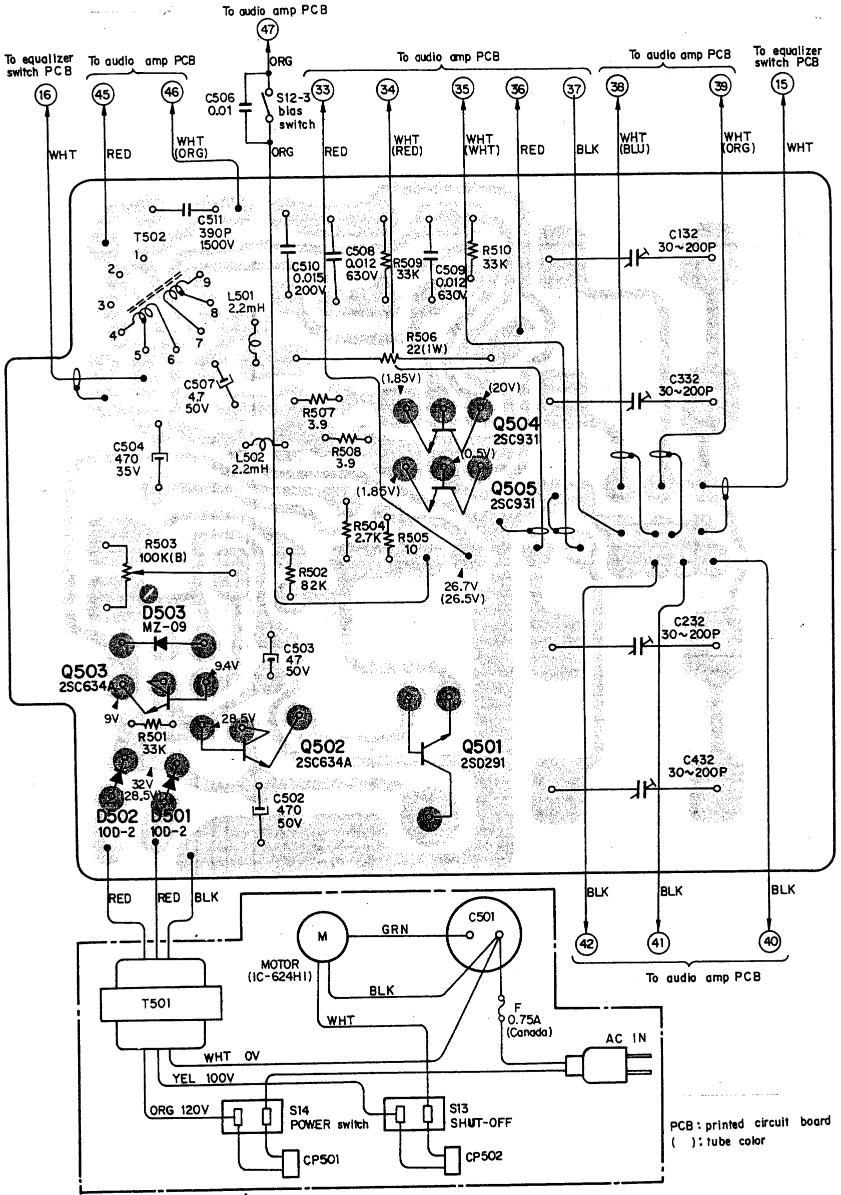
S7 – 1 ~ 4 . . . SYSTEM SELECT (4CH POSITION)
S8 – 1 ~ 4 . . . HEADPHONE (FRONT POSITION)
S9 – 1 ~ 9 . . . REC EQUALIZER (19 cm/s POSITION)
S10. . . . . FRONT MUTING SW (ON POSITION)
S11. . . . . REAR MUTING SW (ON POSITION)
S12 – 1. . . . . . FRONT MUTING (OFF POSITION)
S12 – 2 . . . . . REAR MUTING (OFF POSITION)
S12 – 3 . . . . . BIAS SW (OFF POSITION)
S13. . . . . MOTOR AUTO-SHUT-OFF (OFF POSITION)
S14. . . . . POWER (ON POSITION)
S15. . . . . FREQUENCY CHANGE (50 Hz) (General Export and GEP)

2. ⊘ : adjustable
3. Voltage values are measured by a voltmeter (20 kΩ/V) with no signal input in playback mode. Voltage values in parentheses are measured in record mode. Variations may be noted due to normal production tolerances.
4. All resistors and capacitors are shown in Ω and μF respectively, unless otherwise indicated.
5. The suffix latters (A) and (B) of variable resistor indicates its characteristics.

4-2. MOUNTING DIAGRAMS

4-2-1. Power Supply and Bias OSC Circuit Board

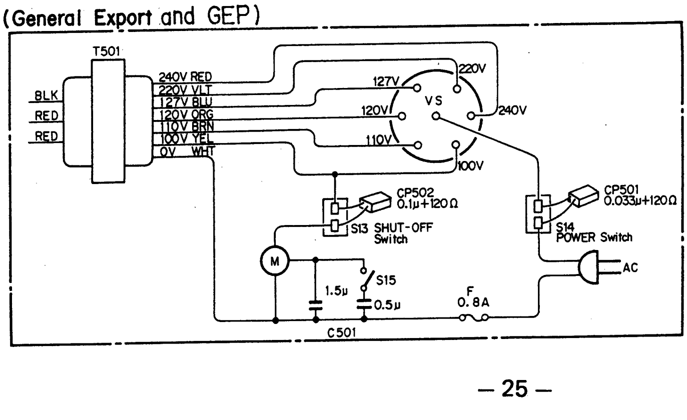
–Conductor Side –


To audio amp PCB
47
ORG
To equalizer switch PCB
16
To audio amp PCB
45
46
C506 0.01
S12-3 bias switch
To audio amp PCB
33
34
35
36
37
To audio amp PCB
38
39
To equalizer switch PCB
15
WHT
RED
WHT (ORG)
ORG
RED
WHT (RED)
WHT (WHT)
RED
BLK
WHT (BLU)
WHT (ORG)
WHT
C511 390P 1500V
T502
C510 0.015 200V
C508 0.012 630V
R509 33K
C509 0.012 630V
R510 33K
C132 30~200P
L501 2.2mH
R506 22(1W)
(1.85V)
(20V)
C507 4.7 50V
R507 3.9
Q504 2SC931
C332 30~200P
C504 470 35V
L502 2.2mH
R508 3.9
(0.5V)
(1.85V)
Q505 2SC931
R504 2.7K
R505 10
R503 100K(B)
R502 82K
26.7V (26.5V)
D503 MZ-09
C232 30~200P
C503 47 50V
Q503 2SC634A
9.4V
9V
R501 33K
28.5V
Q502 2SC634A
Q501 2SD291
32V
28.5V
C502 470 50V
C432 30~200P
D502 10D-2
D501 10D-2
RED
RED
BLK
BLK
BLK
BLK
42
41
40
To audio amp PCB
M
MOTOR (IC-624H1)
GRN
C501
BLK
T501
WHT
F 0.75A (Canada)
AC IN
WHT 0V
YEL 100V
ORG 120V
S14 POWER switch
S13 SHUT-OFF
CP501
CP502

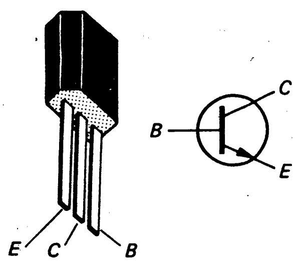
PCB: printed circuit board
( ): tube color

(USA and Canada)

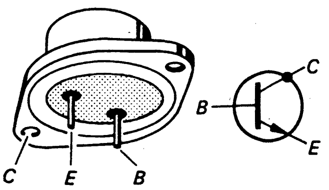
(General Export and GEP)


T501
BLK
RED
RED
240V RED
220V VLT
127V BLU
120V ORG
110V BRN
100V YEL
0V WHT
127V
220V
120V
VS
240V
110V
100V
CP502 0.1μ+120Ω
CP501 0.033μ+120Ω
S13 SHUT-OFF Switch
S14 POWER Switch
AC
M
S15
1.5μ
0.5μ
F 0.8A
C501

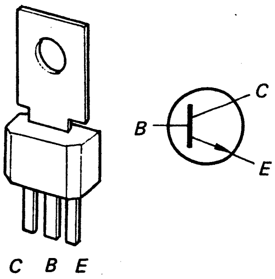
2SC634A



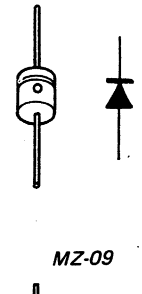
2SD291



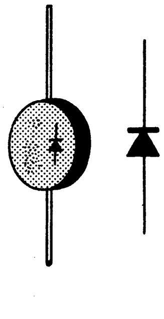
2SC931



10D2

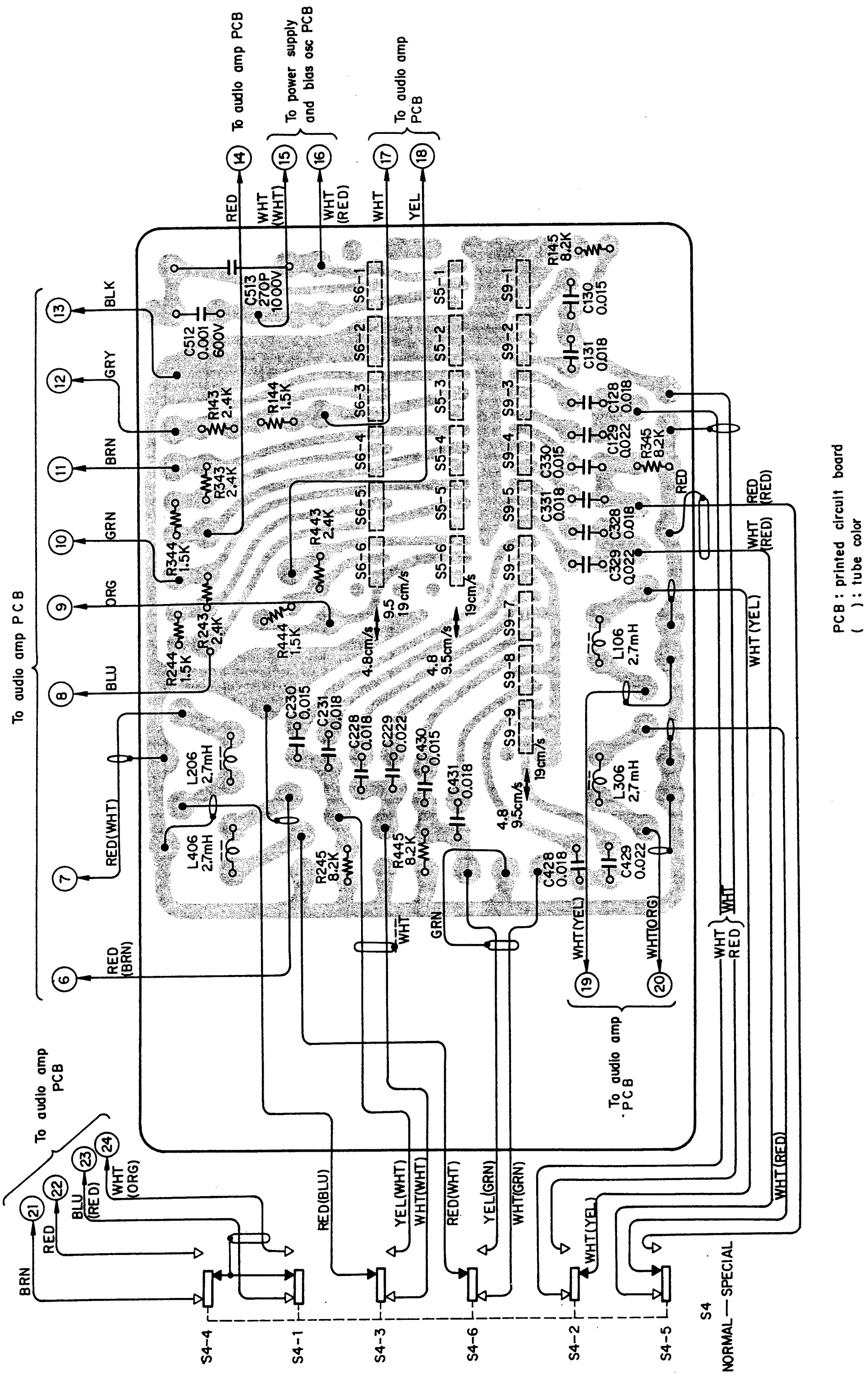


MZ-09



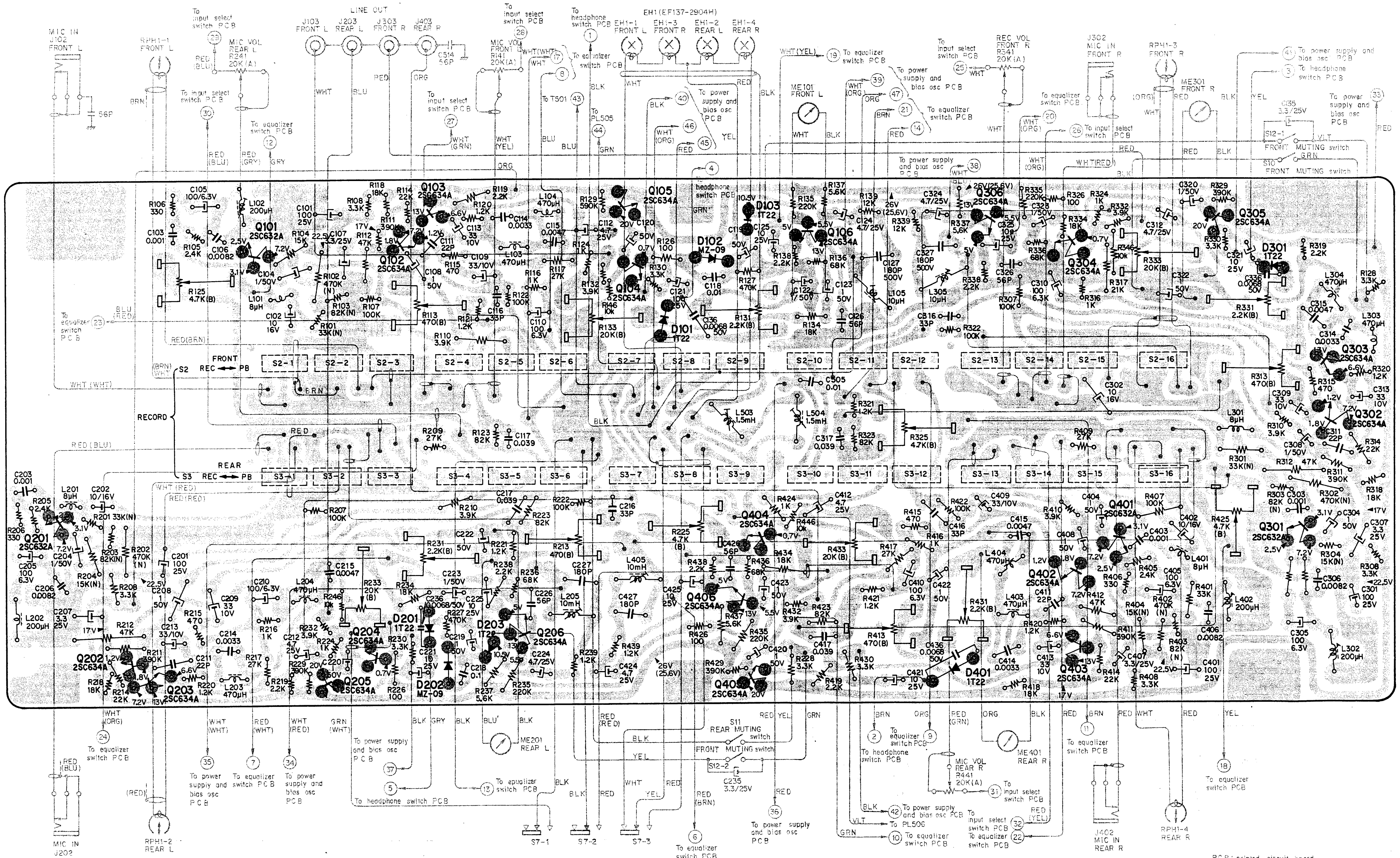
4-2-2. Equalizer Switch Circuit Board

– Conductor Side –


To audio amp PCB
To power supply and bias osc PCB
To audio amp PCB
RED
WHT (WHT)
WHT (RED)
WHT
YEL
⑭
⑮
⑯
⑰
⑱
To audio amp PCB
BLK
GRY
BRN
GRN
ORG
BLU
RED(WHT)
RED (BRN)
⑬
⑫
⑪
⑩
⑨
⑧
⑦
⑥
C513 270P 1000V
C512 0.001 600V
R143 2.4K
R144 1.5K
R343 2.4K
R344 1.5K
R443 2.4K
R243 2.4K
R244 1.5K
R444 1.5K
R145 8.2K
R345 8.2K
R245 8.2K
R445 8.2K
S6-1
S6-2
S6-3
S6-4
S6-5
S6-6
S5-1
S5-2
S5-3
S5-4
S5-5
S5-6
S9-1
S9-2
S9-3
S9-4
S9-5
S9-6
S9-7
S9-8
S9-9
C130 0.015
C131 0.018
C128 0.018
C129 0.022
C330 0.015
C331 0.018
C328 0.018
C329 0.022
C230 0.015
C231 0.018
C228 0.018
C229 0.022
C430 0.015
C431 0.018
C428 0.018
C429 0.022
L106 2.7mH
L206 2.7mH
L306 2.7mH
L406 2.7mH
9.5 19cm/s
4.8cm/s
19cm/s
4.8 9.5cm/s
19cm/s
4.8 9.5cm/s
WHT
GRN
WHT(YEL)
WHT(ORG)
⑲
⑳
To audio amp PCB
WHT
RED
WHT
RED
WHT (RED)
WHT (RED)
WHT (YEL)
PCB : printed circuit board
( ) : tube color
To audio amp PCB
㉑
㉒
㉓
㉔
BRN
RED
BLU (RED)
WHT (ORG)
RED(BLU)
YEL(WHT)
WHT(WHT)
RED(WHT)
YEL(GRN)
WHT(GRN)
WHT(YEL)
WHT(RED)
S4-4
S4-1
S4-3
S4-6
S4-2
S4-5
S4
NORMAL — SPECIAL

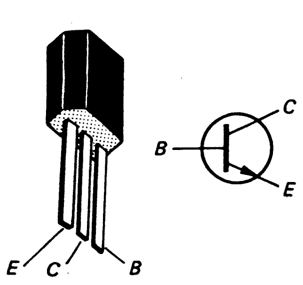
4-2-3. Audio Amp Circuit Board

– Conductor Side –

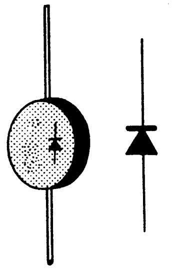

MIC IN J102 FRONT L
RPH1-1 FRONT L
LINE OUT
J103 FRONT L
J203 REAR L
J303 FRONT R
J403 REAR R
EH1 (EF137-2904H)
EH1-1 FRONT L
EH1-3 FRONT R
EH1-2 REAR L
EH1-4 REAR R
MIC VOL REAR L R241 20K(A)
MIC VOL FRONT L R141 20K(A)
To input select switch PCB
To equalizer switch PCB
To headphone switch PCB
To power supply and bias osc PCB
To T501
To PL505
ME101 FRONT L
REC VOL FRONT R R341 20K(A)
J302 MIC IN FRONT R
RPH1-3 FRONT R
ME301 FRONT R
S12-1 FRONT MUTING switch
S10 FRONT MUTING switch
C35 3.3/25V
Q101 2SC632A
Q102 2SC634A
Q103 2SC634A
Q104 2SC634A
Q105 2SC634A
Q106 2SC634A
D101 1T22
D102 MZ-09
D103 1T22
Q301 2SC632A
Q302 2SC634A
Q303 2SC634A
Q304 2SC634A
Q305 2SC634A
Q306 2SC634A
D301 1T22
Q201 2SC632A
Q202 2SC634A
Q203 2SC634A
Q204 2SC634A
Q205 2SC634A
Q206 2SC634A
D201 1T22
D202 MZ-09
D203 1T22
Q401 2SC632A
Q402 2SC634A
Q403 2SC634A
Q404 2SC634A
Q405 2SC634A
Q406 2SC634A
D401 1T22
FRONT
S2 REC ◄—► PB
RECORD
REAR
S3 REC ◄—► PB
S2-1 S2-2 S2-3 S2-4 S2-5 S2-6 S2-7 S2-8 S2-9 S2-10 S2-11 S2-12 S2-13 S2-14 S2-15 S2-16
S3-1 S3-2 S3-3 S3-4 S3-5 S3-6 S3-7 S3-8 S3-9 S3-10 S3-11 S3-12 S3-13 S3-14 S3-15 S3-16
L503 1.5mH
L504 1.5mH
R325 4.7K(B)
R321 1.2K
R323 82K
C317 0.039
C305 0.01
S11 REAR MUTING switch
S12-2 FRONT MUTING switch
C235 3.3/25V
ME201 REAR L
ME401 REAR R
MIC VOL REAR R R441 20K(A)
To PL506
S7-1 S7-2 S7-3
MIC IN J202 REAR L
RPH1-2 REAR L
J402 MIC IN REAR R
RPH1-4 REAR R

PCB : printed circuit board
( ) : tube color

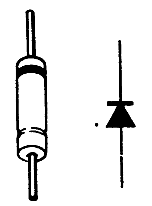
2SC632A, 2SC634A



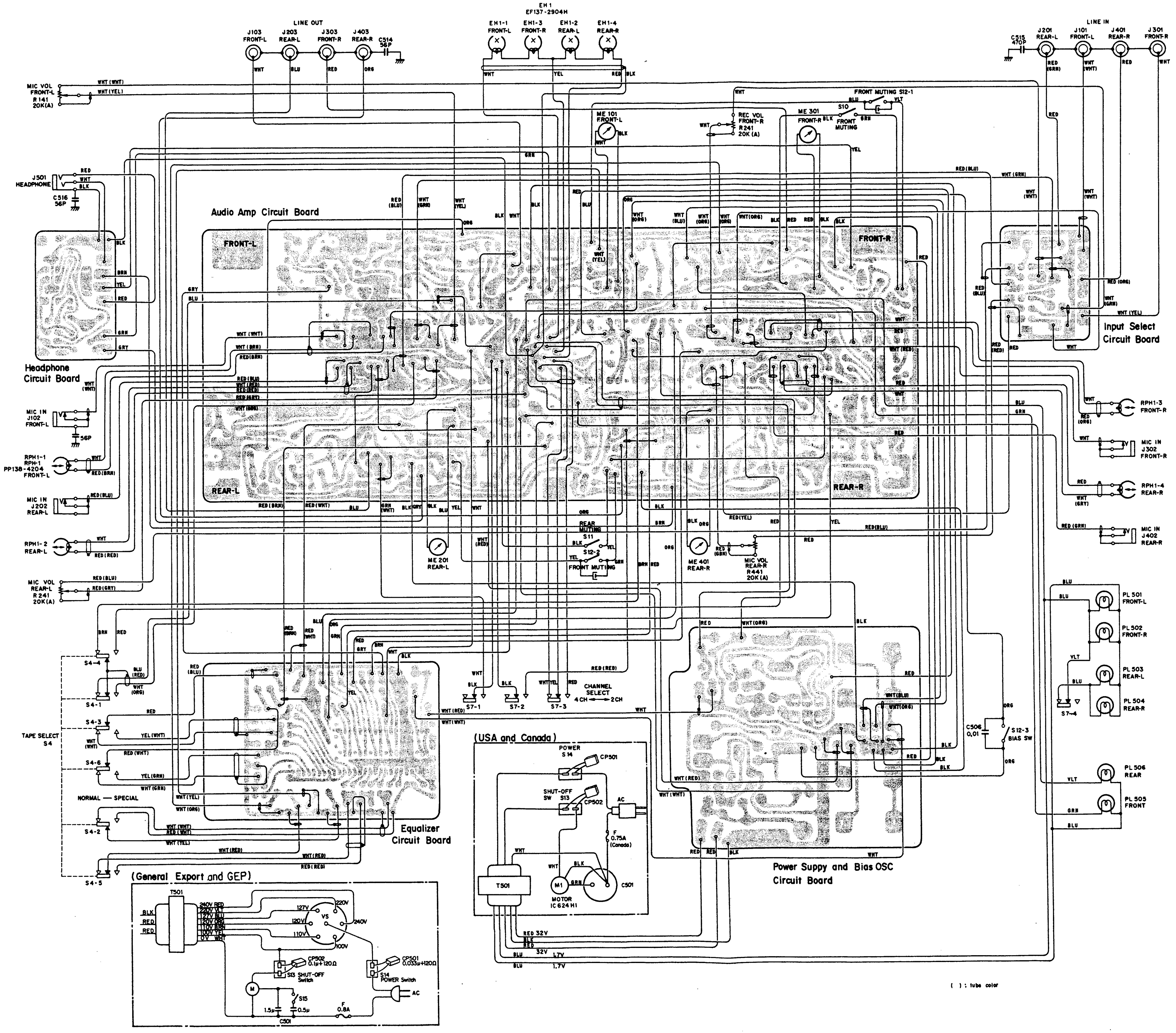
MZ-09



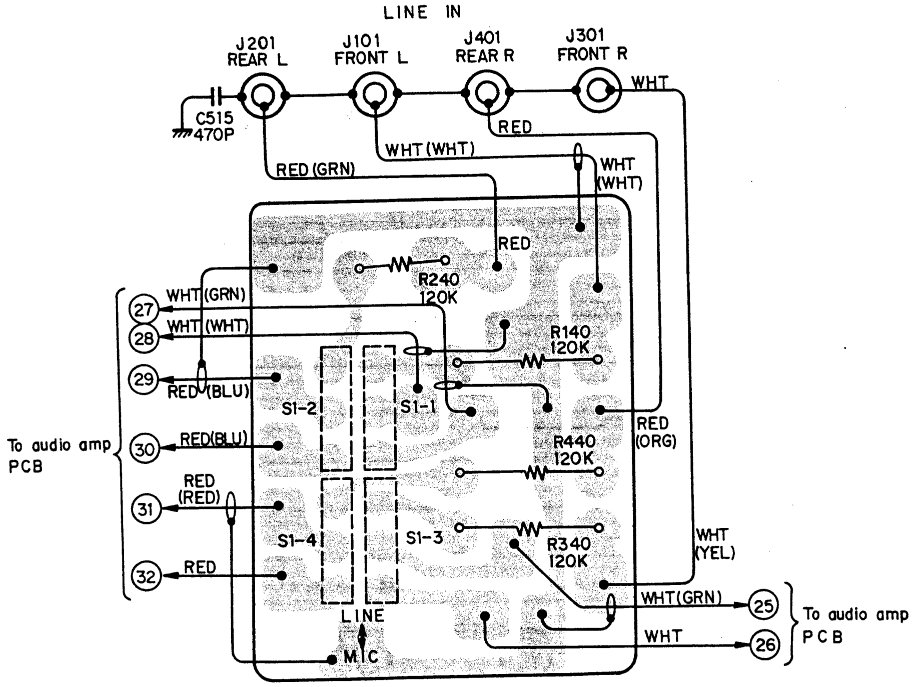
1T22



4-2-4. Wiring

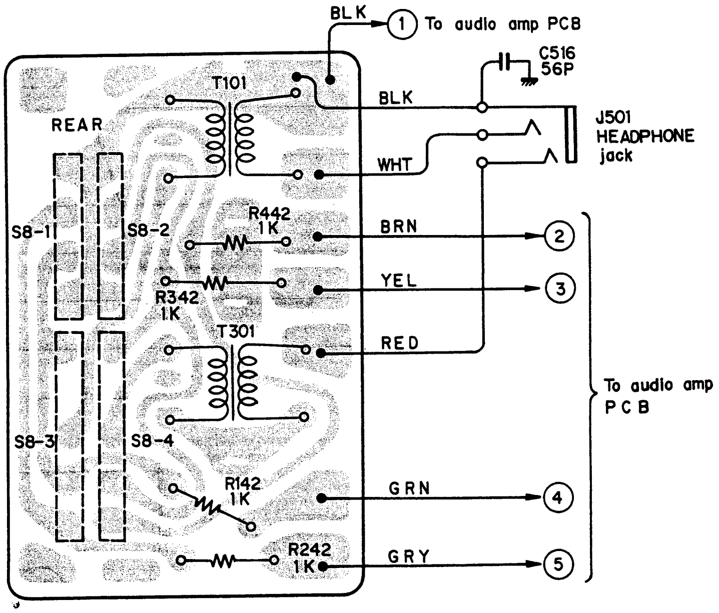

LINE OUT
J103 FRONT-L
J203 REAR-L
J303 FRONT-R
J403 REAR-R
C514 56P
EH1 EF137-2904H
EH1-1 FRONT-L
EH1-3 FRONT-R
EH1-2 REAR-L
EH1-4 REAR-R
LINE IN
C515 470P
J201 REAR-L
J101 FRONT-L
J401 REAR-R
J301 FRONT-R
MIC VOL FRONT-L R141 20K(A)
ME 101 FRONT-L
REC VOL FRONT-R R241 20K (A)
ME 301 FRONT-R
FRONT MUTING S12-1
S10 FRONT MUTING
J501 HEADPHONE
C516 56P
Audio Amp Circuit Board
FRONT-L
FRONT-R
REAR-L
REAR-R
Headphone Circuit Board
Input Select Circuit Board
MIC IN J102 FRONT-L
RPH1-1 RPH-1 PP138-4204 FRONT-L
MIC IN J202 REAR-L
RPH1-2 REAR-L
MIC VOL REAR-L R241 20K(A)
RPH1-3 FRONT-R
MIC IN J302 FRONT-R
RPH1-4 REAR-R
MIC IN J402 REAR-R
ME 201 REAR-L
REAR MUTING S11
S12-2
FRONT MUTING
ME 401 REAR-R
MIC VOL REAR-R R441 20K (A)
PL 501 FRONT-L
PL 502 FRONT-R
PL 503 REAR-L
PL 504 REAR-R
S7-4
PL 506 REAR
PL 505 FRONT
S4-4
S4-1
S4-3
TAPE SELECT S4
S4-6
NORMAL — SPECIAL
S4-2
S4-5
S7-1
S7-2
S7-3
CHANNEL SELECT 4CH ⟷ 2CH
Equalizer Circuit Board
(USA and Canada)
POWER S14
CP501
SHUT-OFF SW S13
CP502
AC
F 0.75A (Canada)
T501
M1
MOTOR IC624H1
C501
RED 32V
BLK
RED
32V
BLU 1.7V
C506 0.01
S12-3 BIAS SW
Power Suppy and Bias OSC Circuit Board
(General Export and GEP)
T501
240V RED
220V VLT
127V BLU
120V ORG
110V BRN
100V YEL
0V WHT
127V
120V
110V
220V
240V
100V
VS
CP502 0.1μ+120Ω
S13 SHUT-OFF Switch
CP501 0.033μ+120Ω
S14 POWER Switch
AC
M
S15
1.5μ
0.5μ
C501
F 0.8A
( ) : tube color

4-2-5. Input Select Switch Circuit Board


LINE IN
J201
REAR L
J101
FRONT L
J401
REAR R
J301
FRONT R
WHT
C515
470P
RED
WHT (WHT)
RED (GRN)
WHT
(WHT)
RED
R240
120K
WHT (GRN)
27
WHT (WHT)
28
R140
120K
29
RED (BLU)
S1-2
S1-1
RED
(ORG)
To audio amp
PCB
30
RED(BLU)
R440
120K
RED
(RED)
31
S1-4
S1-3
R340
120K
WHT
(YEL)
32
RED
WHT(GRN)
25
To audio amp
PCB
LINE
WHT
26
MIC

PCB; printed circuit board
( ); tube color

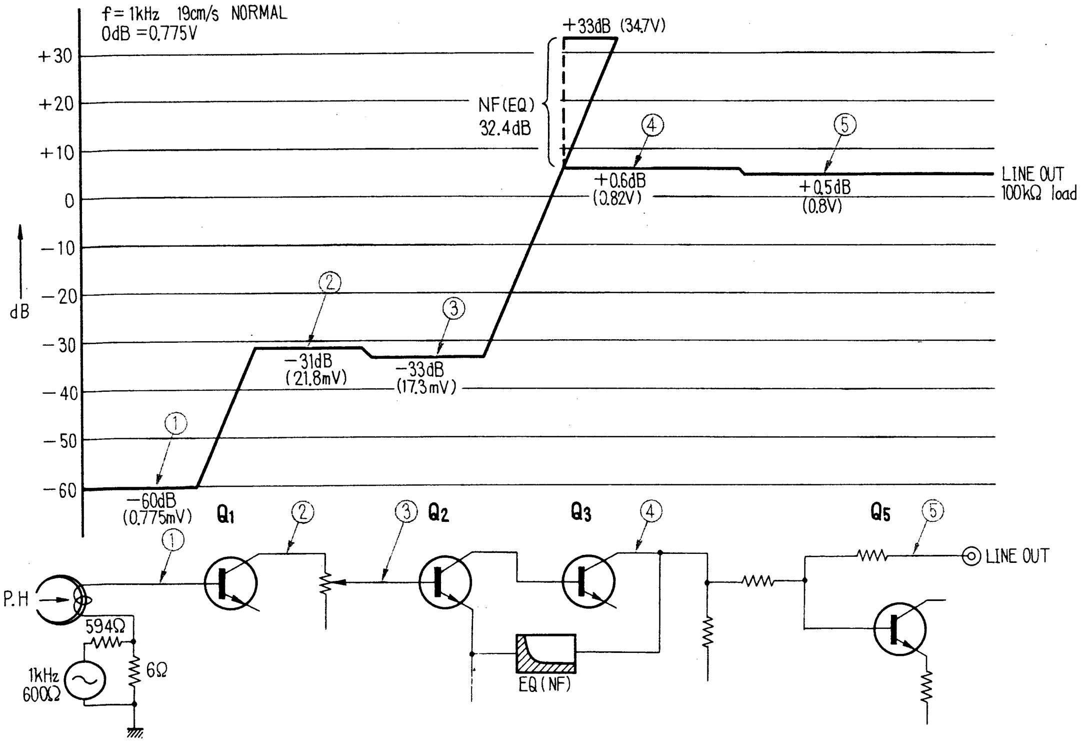
4-2-6. Headphone Switch Circuit Board


BLK
1
To audio amp PCB
C516
56P
T101
BLK
J501
HEADPHONE
jack
REAR
WHT
S8-1
S8-2
R442
1K
BRN
2
R342
1K
YEL
3
T301
RED
To audio amp
PCB
S8-3
S8-4
R142
1K
GRN
4
R242
1K
GRY
5

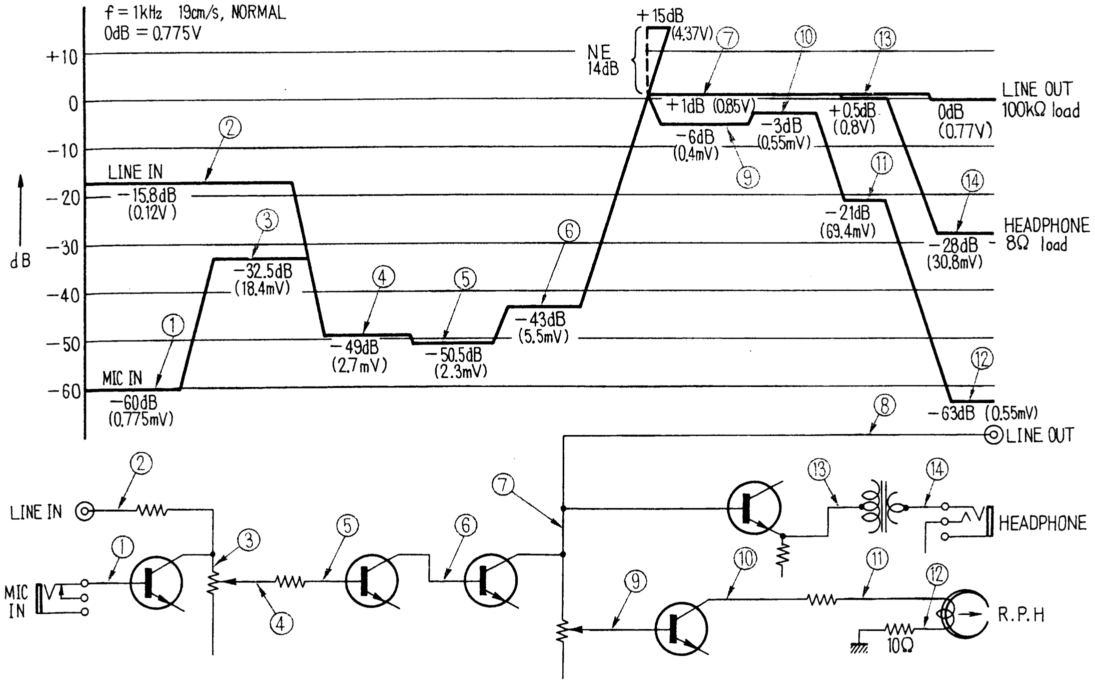
PCB : printed circuit board

4-3. LEVEL DIAGRAMS

Playback

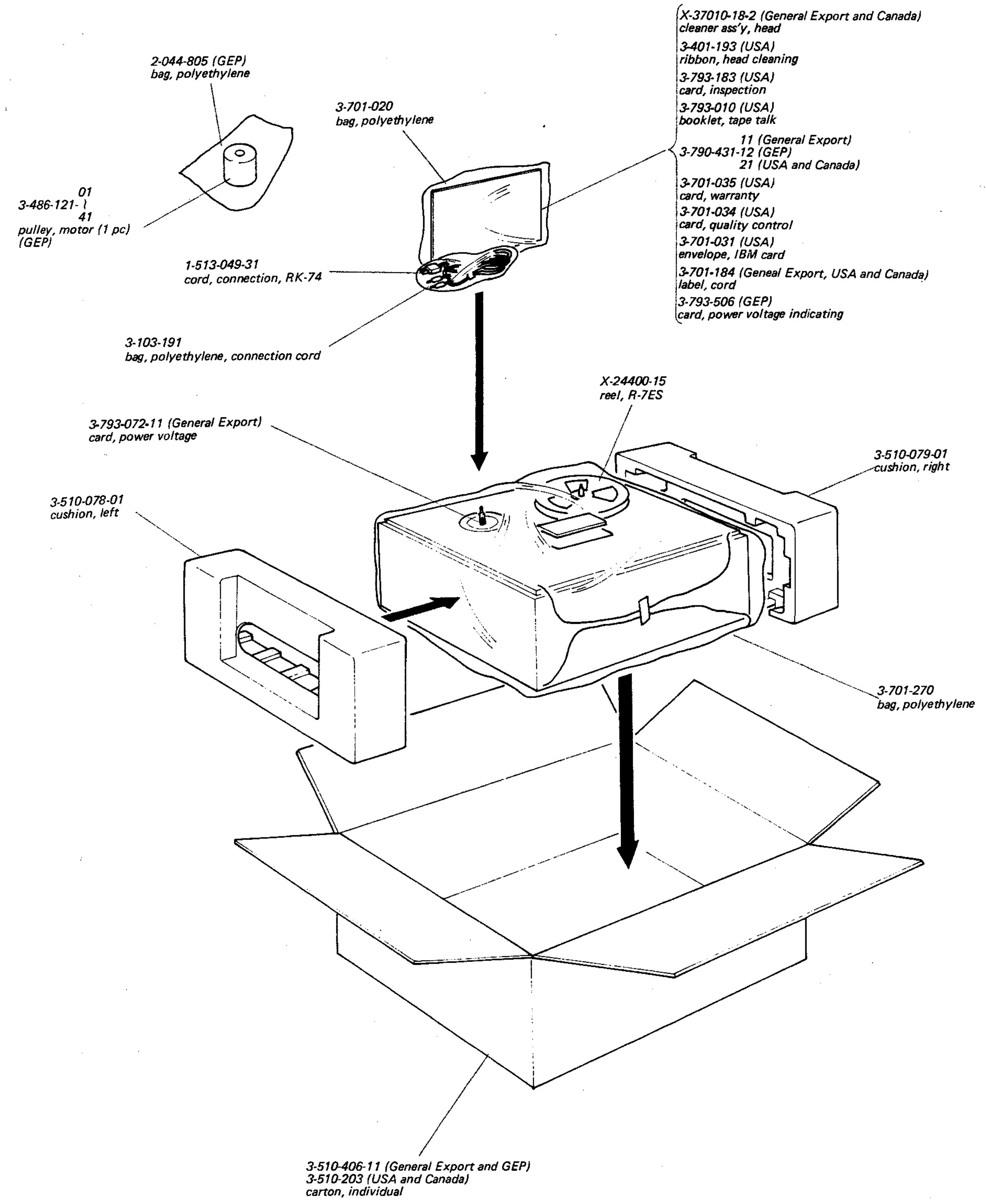

f = 1kHz 19cm/s NORMAL
0dB = 0.775V
+30
+20
+10
0
−10
−20
−30
−40
−50
−60
dB
+33dB (34.7V)
NF(EQ) 32.4dB
④
⑤
+0.6dB (0.82V)
+0.5dB (0.8V)
LINE OUT 100kΩ load
②
③
−31dB (21.8mV)
−33dB (17.3mV)
①
−60dB (0.775mV)
Q1
Q2
Q3
Q5
LINE OUT
P.H
594Ω
6Ω
1kHz 600Ω
EQ(NF)

Record

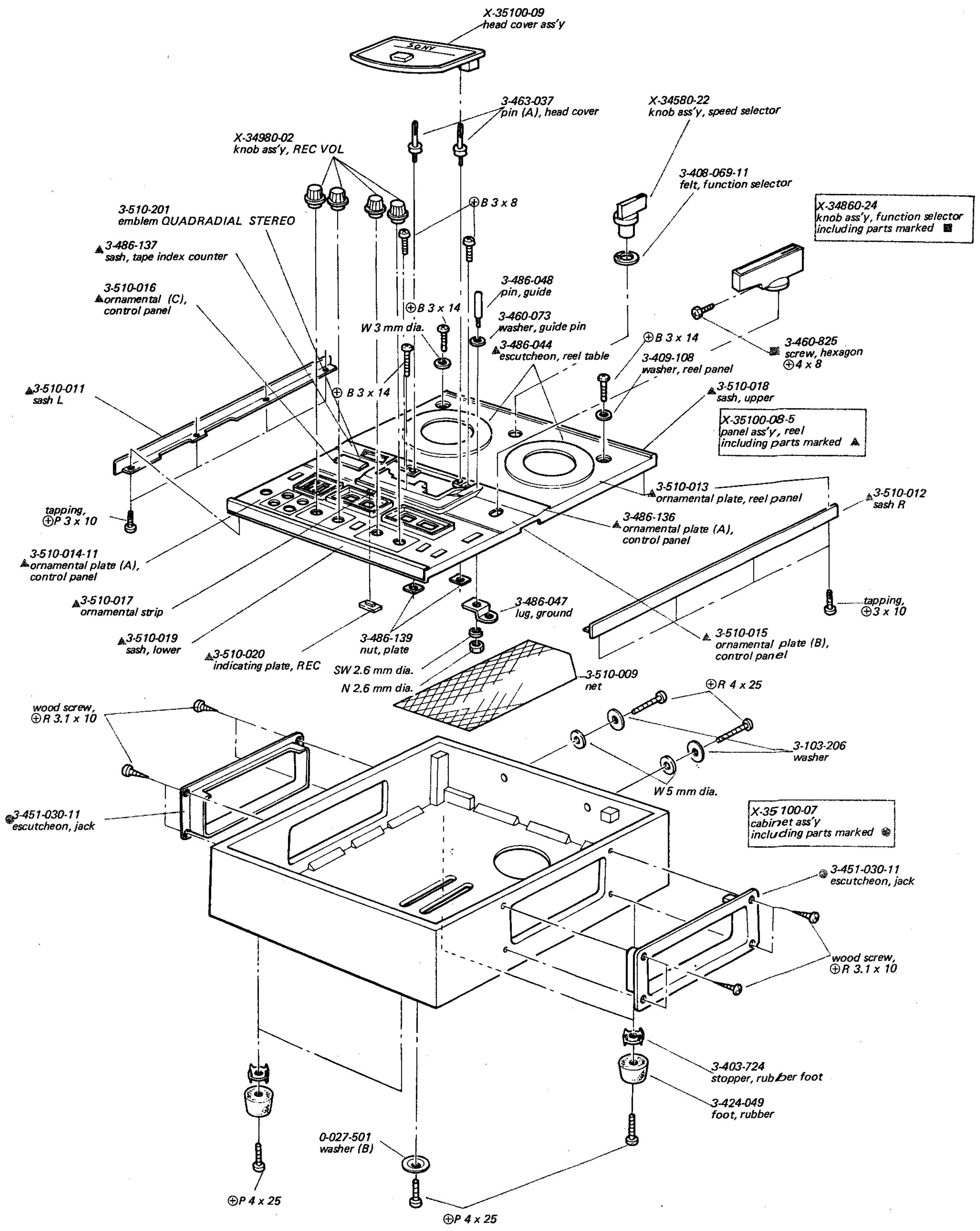

f = 1kHz 19cm/s, NORMAL
0dB = 0.775V
+10
0
−10
−20
−30
−40
−50
−60
dB
+15dB (4.37V)
NE 14dB
⑦
⑩
⑬
+1dB (0.85V)
−6dB (0.4mV)
⑨
−3dB (0.55mV)
+0.5dB (0.8V)
0dB (0.77V)
LINE OUT 100kΩ load
②
LINE IN
−15.8dB (0.12V)
③
−32.5dB (18.4mV)
⑪
−21dB (69.4mV)
⑭
HEADPHONE 8Ω load
−28dB (30.8mV)
⑥
④
⑤
−43dB (5.5mV)
−49dB (2.7mV)
−50.5dB (2.3mV)
①
MIC IN
−60dB (0.775mV)
⑫
−63dB (0.55mV)
⑧
LINE OUT
LINE IN
MIC IN
HEADPHONE
R.P.H
10Ω

SECTION 5
EXPLODED VIEWS

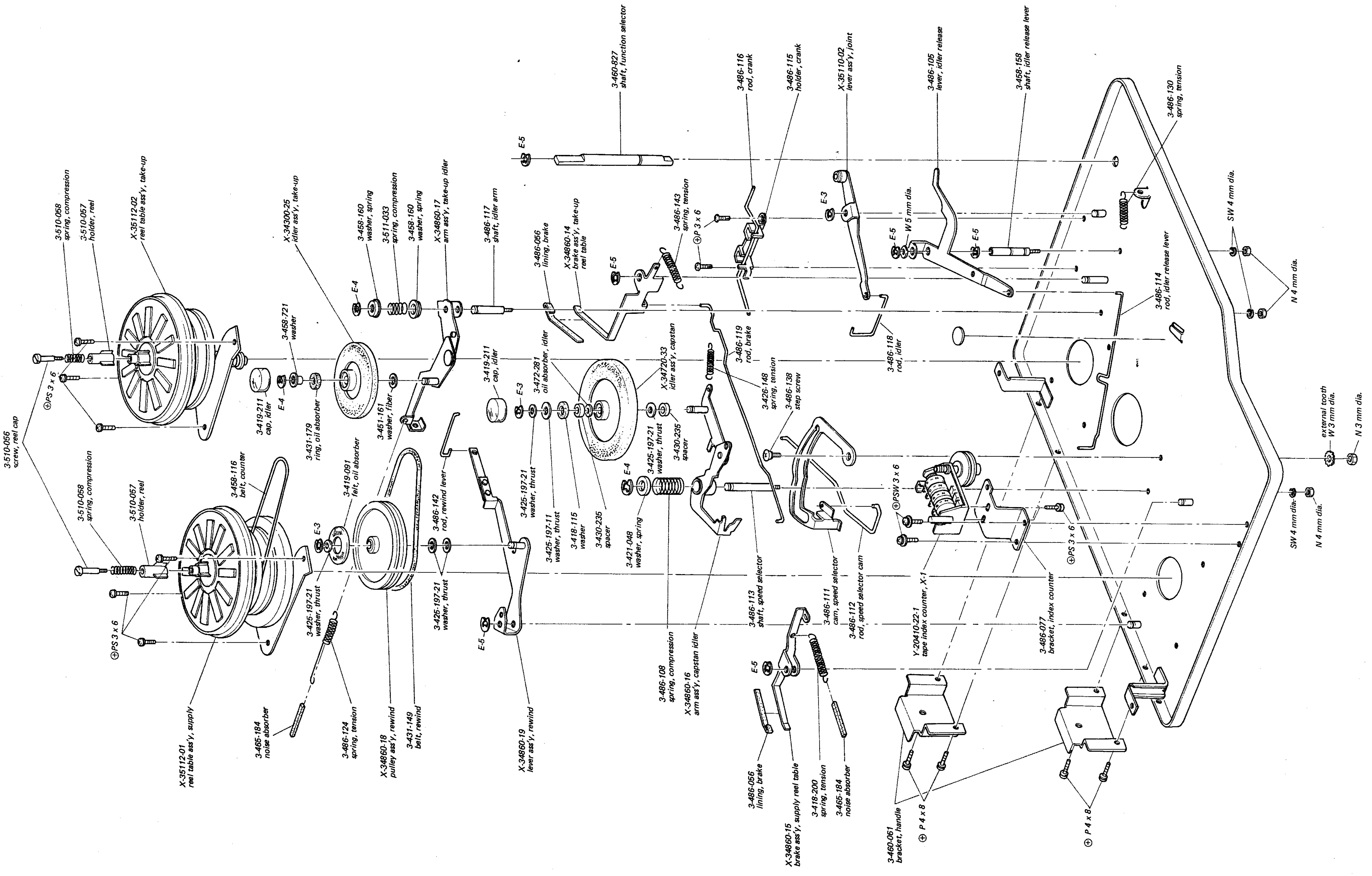
5-1. PACKING


2-044-805 (GEP)
bag, polyethylene
3-701-020
bag, polyethylene
X-37010-18-2 (General Export and Canada)
cleaner ass'y, head
3-401-193 (USA)
ribbon, head cleaning
3-793-183 (USA)
card, inspection
3-793-010 (USA)
booklet, tape talk
11 (General Export)
3-790-431-12 (GEP)
21 (USA and Canada)
3-701-035 (USA)
card, warranty
3-701-034 (USA)
card, quality control
3-701-031 (USA)
envelope, IBM card
3-701-184 (Geneal Export, USA and Canada)
label, cord
3-793-506 (GEP)
card, power voltage indicating
01
3-486-121-
41
pulley, motor (1 pc)
(GEP)
1-513-049-31
cord, connection, RK-74
3-103-191
bag, polyethylene, connection cord
X-24400-15
reel, R-7ES
3-793-072-11 (General Export)
card, power voltage
3-510-079-01
cushion, right
3-510-078-01
cushion, left
3-701-270
bag, polyethylene
3-510-406-11 (General Export and GEP)
3-510-203 (USA and Canada)
carton, individual

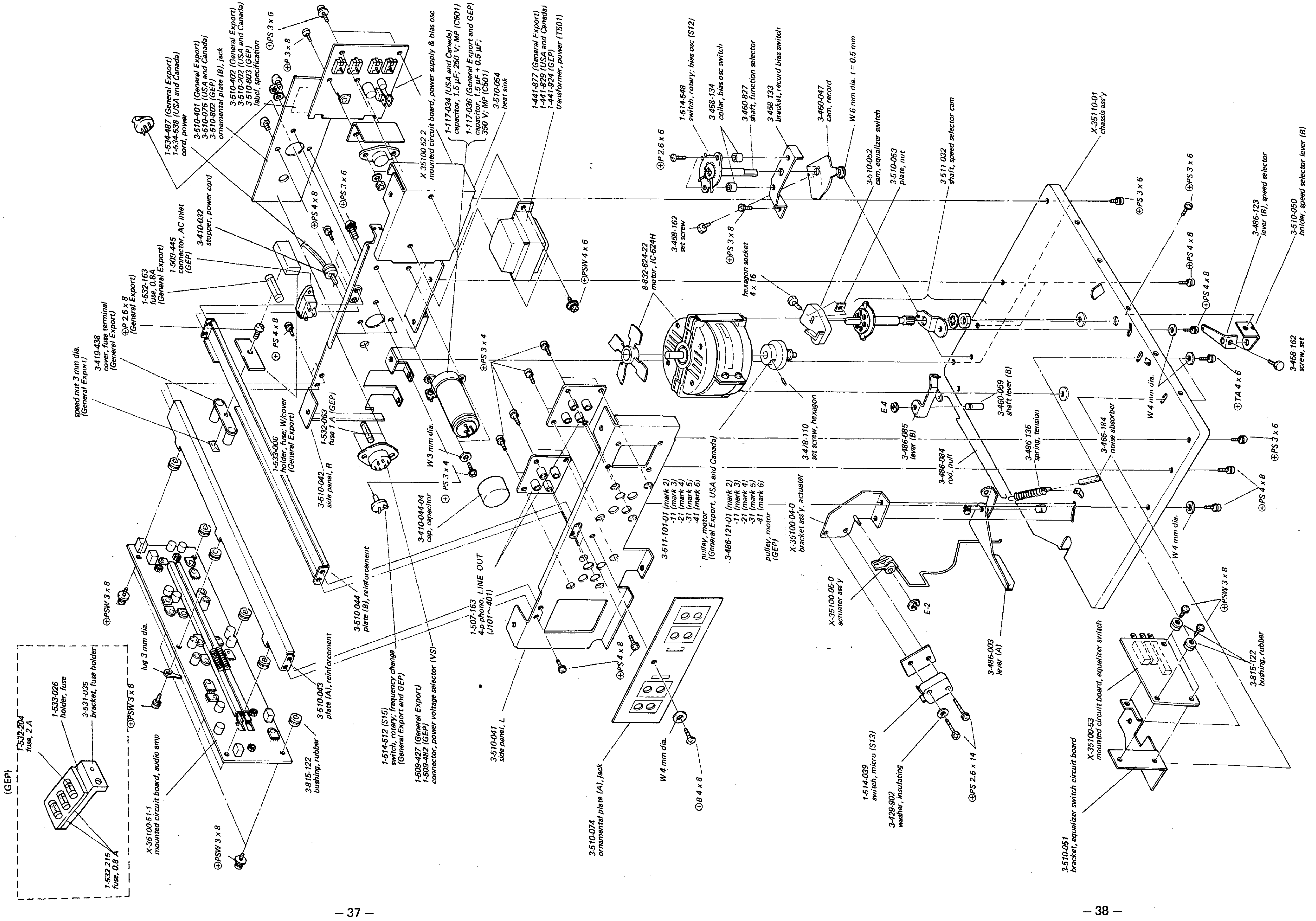
5-2. CABINET – *top view* –


X-35100-09
head cover ass'y
SONY
3-463-037
pin (A), head cover
X-34580-22
knob ass'y, speed selector
X-34980-02
knob ass'y, REC VOL
3-408-069-11
felt, function selector
X-34860-24
knob ass'y, function selector
including parts marked ■
⊕B 3 x 8
3-510-201
emblem QUADRADIAL STEREO
▲3-486-137
sash, tape index counter
3-486-048
pin, guide
3-510-016
▲ornamental (C),
control panel
⊕B 3 x 14
3-460-073
washer, guide pin
W 3 mm dia.
▲3-486-044
escutcheon, reel table
⊕B 3 x 14
3-460-825
■ screw, hexagon
⊕4 x 8
3-409-108
washer, reel panel
▲3-510-011
sash L
⊕ B 3 x 14
▲3-510-018
sash, upper
X-35100-08-5
panel ass'y, reel
including parts marked ▲
tapping,
⊕P 3 x 10
▲3-510-013
ornamental plate, reel panel
▲3-510-012
sash R
▲3-486-136
ornamental plate (A),
control panel
3-510-014-11
▲ornamental plate (A),
control panel
▲3-510-017
ornamental strip
3-486-047
lug, ground
tapping,
⊕3 x 10
▲3-510-019
sash, lower
▲3-510-020
indicating plate, REC
3-486-139
nut, plate
SW 2.6 mm dia.
N 2.6 mm dia.
▲ 3-510-015
ornamental plate (B),
control panel
3-510-009
net
⊕R 4 x 25
wood screw,
⊕R 3.1 x 10
3-103-206
washer
W 5 mm dia.
●3-451-030-11
escutcheon, jack
X-35100-07
cabinet ass'y
including parts marked ●
● 3-451-030-11
escutcheon, jack
wood screw,
⊕R 3.1 x 10
3-403-724
stopper, rubber foot
3-424-049
foot, rubber
0-027-501
washer (B)
⊕P 4 x 25
⊕P 4 x 25

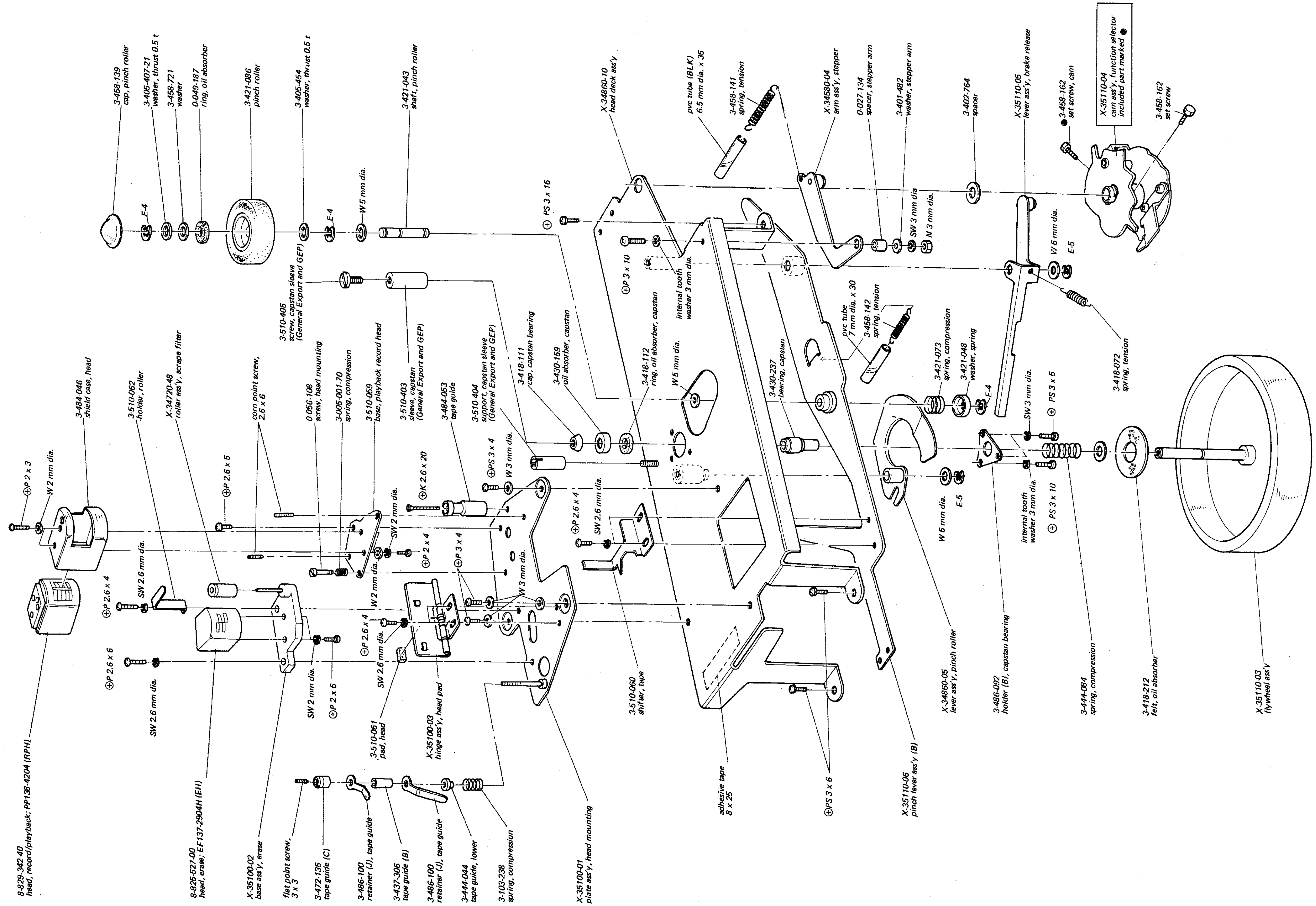
5-3. CHASSIS – *top view* –


3-510-058 spring, compression
3-510-057 holder, reel
X-35112-02 reel table ass'y, take-up
⊕PS 3 x 6
3-510-056 screw, reel cap
3-510-058 spring, compression
3-510-057 holder, reel
3-458-116 belt, counter
⊕PS 3 x 6
X-35112-01 reel table ass'y, supply
3-465-184 noise absorber
3-486-124 spring, tension
X-34860-18 pulley ass'y, rewind
3-431-149 belt, rewind
X-34860-19 lever ass'y, rewind
E-5
3-425-197-21 washer, thrust
3-425-197-21 washer, thrust
E-3
3-419-091 felt, oil absorber
3-486-142 rod, rewind lever
3-419-211 cap, idler
E-4
3-431-179 ring, oil absorber
3-458-721 washer
X-34300-25 idler ass'y, take-up
3-451-161 washer, fiber
E-4
3-458-160 washer, spring
3-511-033 spring, compression
3-458-160 washer, spring
X-34860-17 arm ass'y, take-up idler
3-486-117 shaft, idler arm
3-419-211 cap, idler
E-3
3-472-281 oil absorber, idler
3-425-197-21 washer, thrust
3-425-197-11 washer, thrust
3-418-115 washer
3-430-235 spacer
3-486-056 lining, brake
X-34860-14 brake ass'y, take-up reel table
E-5
3-486-143 spring, tension
⊕P 3 x 6
X-34720-33 idler ass'y, capstan
3-425-197-21 washer, thrust
3-430-235 spacer
E-4
3-421-048 washer, spring
3-486-108 spring, compression
X-34860-16 arm ass'y, capstan idler
3-486-113 shaft, speed selector
3-486-119 rod, brake
3-426-148 spring, tension
3-486-138 step screw
E-5
3-460-827 shaft, function selector
3-486-116 rod, crank
3-486-115 holder, crank
X-35110-02 lever ass'y, joint
E-3
E-5
W 5 mm dia.
3-486-105 lever, idler release
E-5
3-458-158 shaft, idler release lever
3-486-130 spring, tension
3-486-118 rod, idler
3-486-114 rod, idler release lever
SW 4 mm dia.
N 4 mm dia.
external tooth W 3 mm dia.
N 3 mm dia.
SW 4 mm dia.
N 4 mm dia.
⊕PSW 3 x 6
⊕PS 3 x 6
3-486-111 cam, speed selector
3-486-112 rod, speed selector cam
Y-20410-22-1 tape index counter, X-1
3-486-077 bracket, index counter
E-5
3-486-056 lining, brake
X-34860-15 brake ass'y, supply reel table
3-418-200 spring, tension
3-465-184 noise absorber
3-460-061 bracket, handle
⊕ P 4 x 8
⊕ P 4 x 8

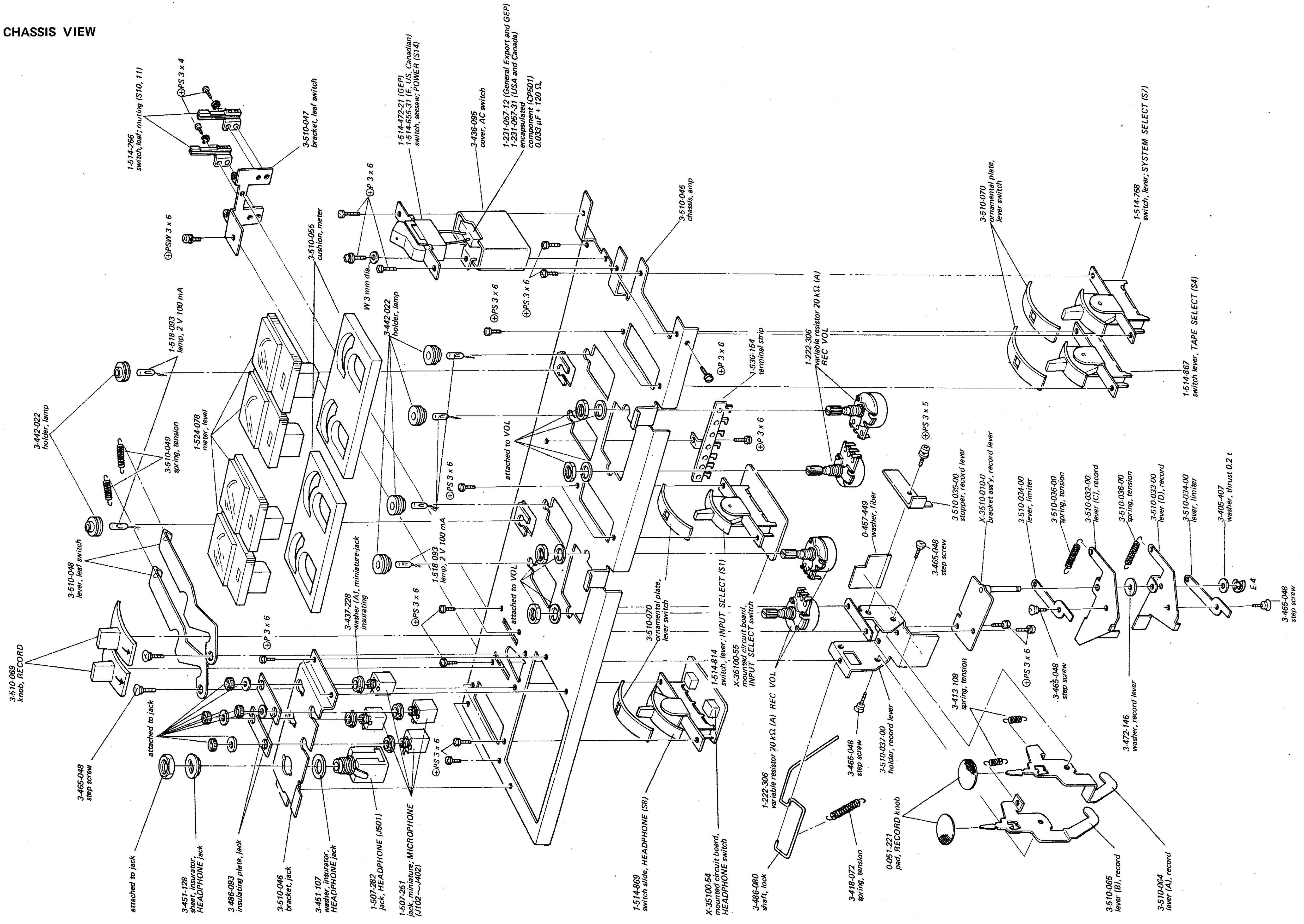
5-4. CHASSIS – *bottom view* –


(GEP)
1-532-204 fuse, 2 A
1-533-026 holder, fuse
3-531-035 bracket, fuse holder
1-532-215 fuse, 0.8 A
⊕PSW 3 x 8
X-35100-51-1 mounted circuit board, audio amp
lug 3 mm dia.
⊕PSW 3 x 8
⊕PSW 3 x 8
3-815-122 bushing, rubber
3-510-043 plate (A), reinforcement
speed nut 3 mm dia. (General Export)
3-419-438 cover, fuse terminal (General Export)
1-533-006 holder, fuse; W/cover (General Export)
3-510-042 side panel, R
3-510-044 plate (B), reinforcement
⊕P 2.6 x 8 (General Export)
1-532-163 fuse, 0.8A (General Export)
1-509-445 connector, AC inlet (GEP)
3-410-032 stopper, power cord
⊕ PS 4 x 8
1-532-063 fuse 1 A (GEP)
1-534-487 (General Export) 1-534-538 (USA and Canada) cord, power
3-510-401 (General Export) 3-510-075 (USA and Canada) 3-510-802 (GEP) ornamental plate (B), jack
3-510-402 (General Export) 3-510-202 (USA and Canada) 3-510-803 (GEP) label, specification
⊕PS 3 x 6
⊕P 3 x 8
⊕PS 4 x 8
⊕PS 3 x 6
1-514-512 (S15) switch, rotary; frequency change (General Export and GEP)
1-509-427 (General Export) 1-509-482 (GEP) connector, power voltage selector (VS)
3-410-044-04 cap, capacitor
⊕ PS 3 x 4
W 3 mm dia.
1-507-163 4-p-phono, LINE OUT (J101~401)
3-510-041 side panel, L
X-35100-52-2 mounted circuit board, power supply & bias osc
1-117-034 (USA and Canada) capacitor, 1.5 µF; 250 V; MP (C501)
1-117-036 (General Export and GEP) capacitor, 1.5 µF + 0.5 µF; 350 V; MP (C501)
3-510-054 heat sink
1-441-877 (General Export) 1-441-829 (USA and Canada) 1-441-924 (GEP) transformer, power (T501)
⊕PS 3 x 4
⊕PSW 4 x 6
⊕PS 4 x 8
3-510-074 ornamental plate (A), jack
W 4 mm dia.
⊕B 4 x 8
8-832-624-22 motor, IC-624H
3-511-101-01 (mark 2) -11 (mark 3) -21 (mark 4) -31 (mark 5) -41 (mark 6) pulley, motor (General Export, USA and Canada)
3-486-121-01 (mark 2) -11 (mark 3) -21 (mark 4) -31 (mark 5) -41 (mark 6) pulley, motor (GEP)
X-35100-04-0 bracket ass'y, actuater
⊕P 2.6 x 6
1-514-548 switch, rotary; bias osc (S12)
3-458-134 collar, bias osc switch
3-460-827 shaft, function selector
3-458-133 bracket, record bias switch
3-458-162 set screw
⊕PS 3 x 8
hexagon socket 4 x 16
3-478-110 set screw, hexagon
3-460-047 cam, record
W 6 mm dia. t = 0.5 mm
3-510-052 cam, equalizer switch
3-510-053 plate, nut
E-4
3-486-085 lever (B)
3-486-084 rod, pull
3-460-059 shaft lever (B)
3-486-135 spring, tension
X-35100-05-0 actuater ass'y
E-2
3-486-003 lever (A)
1-514-039 switch, micro (S13)
3-429-902 washer, insulating
⊕PS 2.6 x 14
3-511-032 shaft, speed selector cam
3-465-184 noise absorber
X-35110-01 chassis ass'y
W 4 mm dia.
W 4 mm dia.
⊕PS 3 x 6
⊕PS 3 x 6
⊕PS 4 x 8
⊕PS 4 x 8
⊕TA 4 x 6
3-486-123 lever (B), speed selector
3-510-050 holder, speed selector lever (B)
3-458-162 screw, set
⊕PS 3 x 6
⊕PS 4 x 8
⊕PSW 3 x 8
3-815-122 bushing, rubber
X-35100-53 mounted circuit board, equalizer switch
3-510-051 bracket, equalizer switch circuit board

5-5. HEAD DECK VIEW


3-458-139 cap, pinch roller
3-405-407-21 washer, thrust 0.5 t
3-458-721 washer
0-049-187 ring, oil absorber
3-421-086 pinch roller
3-405-454 washer, thrust 0.5 t
3-421-043 shaft, pinch roller
X-34860-10 head deck ass'y
pvc tube (BLK) 6.5 mm dia. x 35
3-458-141 spring, tension
X-34580-04 arm ass'y, stepper
0-027-134 spacer, stepper arm
3-401-482 washer, stepper arm
3-402-764 spacer
X-35110-05 lever ass'y, brake release
● 3-458-162 set screw, cam
X-35110-04 cam ass'y, function selector included part marked ●
3-458-162 set screw
E-4
E-4
W 5 mm dia.
⊕ PS 3 x 16
⊕ P 3 x 10
internal tooth washer 3 mm dia.
SW 3 mm dia.
N 3 mm dia.
W 6 mm dia.
E-5
3-510-405 screw, capstan sleeve (General Export and GEP)
pvc tube 7 mm dia. x 30
3-458-142 spring, tension
3-421-073 spring, compression
3-421-048 washer, spring
E-4
3-418-072 spring, tension
SW 3 mm dia.
⊕ PS 3 x 5
3-430-237 bearing, capstan
3-418-112 ring, oil absorber, capstan
W 5 mm dia.
3-430-159 oil absorber, capstan
3-418-111 cap, capstan bearing
3-510-404 support, capstan sleeve (General Export and GEP)
3-484-053 tape guide
3-510-403 sleeve, capstan (General Export and GEP)
3-510-059 base, playback record head
3-005-001-70 spring, compression
0-056-108 screw, head mounting
corn point screw, 2.6 x 6
X-34720-48 roller ass'y, scrape filter
3-510-062 holder, roller
3-484-046 shield case, head
⊕ P 2 x 3
W 2 mm dia.
⊕ P 2.6 x 5
⊕ K 2.6 x 20
⊕ PS 3 x 4
W 3 mm dia.
⊕ P 2.6 x 4
SW 2.6 mm dia.
W 6 mm dia.
E-5
internal tooth washer 3 mm dia.
⊕ PS 3 x 10
SW 2 mm dia.
⊕ P 2 x 4
⊕ P 3 x 4
W 3 mm dia.
W 2 mm dia.
SW 2.6 mm dia.
⊕ P 2.6 x 4
⊕ P 2.6 x 4
SW 2.6 mm dia.
⊕ P 2.6 x 6
SW 2.6 mm dia.
SW 2 mm dia.
⊕ P 2 x 6
SW 2.6 mm dia.
8-829-342-40 head, record/playback; PP138-4204 (RPH)
8-825-527-00 head, erase, EF137-2904H (EH)
X-35100-02 base ass'y, erase
flat point screw, 3 x 3
3-472-135 tape guide (C)
3-486-100 retainer (J), tape guide
3-437-306 tape guide (B)
3-486-100 retainer (J), tape guide
3-444-044 tape guide, lower
3-103-238 spring, compression
X-35100-01 plate ass'y, head mounting
3-510-061 pad, head
X-35100-03 hinge ass'y, head pad
3-510-060 shifter, tape
adhesive tape 8 x 25
⊕ PS 3 x 6
X-35110-06 pinch lever ass'y (B)
X-34860-05 lever ass'y, pinch roller
3-486-092 holder (B), capstan bearing
3-444-084 spring, compression
3-418-212 felt, oil absorber
X-35110-03 flywheel ass'y

5-6. AMP CHASSIS VIEW


1-514-266
switch, leaf; muting (S10, 11)
⊕PS 3 x 4
3-510-047
bracket, leaf switch
⊕PSW 3 x 6
1-518-093
lamp, 2 V 100 mA
3-442-022
holder, lamp
3-510-049
spring, tension
1-524-078
meter, level
3-510-055
cushion, meter
3-510-048
lever, leaf switch
3-510-069
knob, RECORD
3-465-048
step screw
attached to jack
⊕P 3 x 6
3-437-228
washer (A), miniature-jack insurating
3-442-022
holder, lamp
W 3 mm dia.
⊕P 3 x 6
1-514-472-21 (GEP)
1-514-655-31 (E, US, Canadian)
switch, seesaw; POWER (S14)
3-436-095
cover, AC switch
1-231-057-12 (General Export and GEP)
1-231-057-31 (USA and Canada)
encapsulated
component (CP501)
0.033 µF + 120 Ω,
⊕PS 3 x 6
⊕PS 3 x 6
⊕PS 3 x 6
1-518-093
lamp, 2 V 100 mA
⊕PS 3 x 6
attached to VOL
attached to VOL
3-510-045
chassis, amp
⊕P 3 x 6
1-536-154
terminal strip
1-222-306
variable resistor 20 kΩ (A)
REC VOL
⊕P 3 x 6
⊕PS 3 x 5
3-510-070
ornamental plate,
lever switch
1-514-814
switch, lever; INPUT SELECT (S1)
X-35100-55
mounted circuit board,
INPUT SELECT switch
1-222-306
variable resistor 20 kΩ (A) REC VOL
0-457-449
washer, fiber
3-465-048
step screw
3-510-035-00
stopper, record lever
X-3510-010-0
bracket ass'y, record lever
3-510-034-00
lever, limiter
3-510-036-00
spring, tension
3-510-032-00
lever (C), record
3-510-036-00
spring, tension
3-510-033-00
lever (D), record
3-510-034-00
lever, limiter
3-405-407
washer, thrust 0.2 t
E-4
3-465-048
step screw
3-510-070
ornamental plate,
lever switch
1-514-768
switch, lever; SYSTEM SELECT (S7)
1-514-867
switch lever, TAPE SELECT (S4)
3-413-108
spring, tension
⊕PS 3 x 6
3-465-048
step screw
3-472-146
washer, record lever
3-465-048
step screw
3-510-037-00
holder, record lever
1-222-306
variable resistor 20 kΩ (A) REC VOL
0-051-221
pad, RECORD knob
3-486-080
shaft, lock
3-418-072
spring, tension
3-510-065
lever (B), record
3-510-064
lever (A), record
3-465-048
step screw
attached to jack
3-451-128
sheet, insurator,
HEADPHONE jack
3-486-093
insulating plate, jack
3-510-046
bracket, jack
3-451-107
washer, insurator,
HEADPHONE jack
1-507-282
jack, HEADPHONE (J501)
1-507-251
jack, miniature; MICROPHONE
(J102~J402)
⊕PS 3 x 6
⊕PS 3 x 6
1-514-869
switch slide, HEADPHONE (S8)
X-35100-54
mounted circuit board,
HEADPHONE switch

SECTION 6

ELECTRICAL PARTS LIST

PRINTED CIRCUIT BOARD

Ref. No.	*Part No.*	*Description*
	X-35100-51-1	audio amp
	X-35100-52-1	power & bias osc
	X-35100-53	equalizer switch
	X-35100-54	headphone switch
	X-35100-55	input select switch

SEMICONDUCTORS

Ref. No.	*Part No.*	*Description*
Q101		transistor 2SC632A
Q102		transistor 2SC634A
Q103		transistor 2SC634A
Q104		transistor 2SC634A
Q105		transistor 2SC634A
Q106		transistor 2SC634A
Q201		transistor 2SC632A
Q202		transistor 2SC634A
Q203		transistor 2SC634A
Q204		transistor 2SC634A
Q205		transistor 2SC634A
Q206		transistor 2SC634A
Q301		transistor 2SC632A
Q302		transistor 2SC634A
Q303		transistor 2SC634A
Q304		transistor 2SC634A
Q305		transistor 2SC634A
Q306		transistor 2SC634A
Q401		transistor 2SC632A
Q402		transistor 2SC634A
Q403		transistor 2SC634A
Q404		transistor 2SC634A
Q405		transistor 2SC634A
Q406		transistor 2SC634A
Q501		transistor 2SD291
Q502		transistor 2SC634A
Q503		transistor 2SC634A
Q504		transistor 2SC931
Q505		transistor 2SC931
D101, 201		diode 1T-22
D102, 202		diode MZ-09
D103, 203		diode 1T-22
D301, 401		diode 1T-22
D501, 502		diode 10D-2
D503		diode MZ-09

COILS

Ref. No.	*Part No.*	*Description*
L101, 201	1-407-519	inductor, micro; 8 μH
L102, 202	1-409-132	trap; 200 μH
L103, 203	1-407-488	inductor, micro; 470 μH
L104, 204	1-407-488	inductor, micro; 470 μH
L105, 205	1-407-290	inductor, variable; 10 mH
L106, 206	1-407-199	inductor, micro; 2.7 mH
L301, 401	1-407-519	inductor, micro; 8 μH
L302, 402	1-409-132	trap; 200 μH
L303, 403	1-407-488	inductor, micro; 470 μH
L304, 404	1-407-488	inductor, micro; 470 μH
L305, 405	1-407-290	inductor, variable; 10 mH
L306, 406	1-407-199	inductor, micro; 2.7 mH
L501, 502	1-407-198	inductor, micro; 2.2 mH
L503, 504	1-407-285	inductor, variable; 1.5 mH

TRANSFORMERS

Ref. No.	*Part No.*	*Description*
T101, 301	1-427-299	output
T501	1-441-829	power (USA and Canada)
	1-441-877	power (General Export)
	1-441-924	power (GEP)
T502	1-433-152	bias osc

CAPACITORS

Ref. No.	*Part No.*	*Description*
C101, 201 301, 401	1-121-416	100 μF 25 V electrolytic
C102, 202 302, 402	1-121-916	10 μF 16 V electrolytic
C103, 203 303, 403	1-105-058-12	0.001 μF 50 V mylar
C104, 204 304, 404	1-121-391	1 μF 50 V electrolytic
C105, 205 305, 405	1-121-413	100 μF 6.3 V electrolytic
C106, 206 306, 406	1-105-512-12	0.0082 μF 50 V mylar
C107, 207 307, 407	1-121-392	3.3 μF 25 V electrolytic
C108, 208 308, 408	1-121-391	1 μF 50 V electrolytic
C109, 209 309, 409	1-121-402	33 μF 10 V electrolytic
C110, 210 310, 410	1-121-413	100 μF 6.3 V electrolytic
C111, 211 311, 411	1-107-115	22 pF 50 V silvered mica
C112, C212 312, 412	1-121-395	4.7 μF 25 V electrolytic
C113, 213 313, 413	1-121-402	33 μF 10 V electrolytic
C114, 214 314, 414	1-105-507-12	0.0033 μF 50 V mylar
C115, 215 315, 415	1-105-509-12	0.0047 μF 50 V mylar
C116, 216 316, 416	1-107-119	33 pF 50 V silvered mica
C117, 217 317, 417	1-105-520-12	0.039 μF 50 V mylar
C118, 218	1-105-520-12	0.01 μF 50 V mylar
C119, 219	1-121-391	1 μF 50 V electrolytic
C120, 220 320, 420	1-121-391	1 μF 50 V electrolytic
C121, 221 321, 421	1-121-398	10 μF 25 V electrolytic
C122, 222 322, 422	1-121-391	1 μF 50 V electrolytic
C123, 223 323, 423	1-121-391	1 μF 50 V electrolytic
C124, 224 324, 424	1-121-395	4.7 μF 25 V electrolytic
C125, 225 325, 425	1-121-398	10 μF 25 V electrolytic
C126, 226 326, 426	1-107-125	56 pF 50 V silvered mica
C127, 227 327, 427	1-107-175	180 pF 500 V silvered mica
C128, 228 328, 428	1-106-031-12	0.018 μF 50 V mylar
C129, 229 329, 429	1-106-033-12	0.022 μF 50 V mylar
C130, 230 330, 430	1-106-029-12	0.015 μF 50 V mylar
C131, 231 331, 431	1-106-031-12	0.018 μF 50 V mylar
C132, 232 332, 432	1-141-034	30 pF 200 pF trimmer
C135, 235	1-121-392-11	3.3 μF 25 V electrolytic
C136, 236 336, 436	1-105-671-12	0.0068 μF 50 V mylar
C501	1-117-034	1.5 μF 250 V MP (USA and Canada)
	1-117-036	1.5 + 0.5 μF 350 V MP (General Export and GEP)
C502	1-121-810	470 μF 50 V electrolytic
C503	1-121-441	47 μF 50 V electrolytic
C504	1-121-361	470 μF 35 V electrolytic
C505, 506	1-105-520-12	0.01 μF 50 V mylar
C507	1-121-396	4.7 μF 50 V electrolytic
C508, 509	1-129-715	0.012 μF 630 V polypropylene film
C510	1-129-795	0.015 μF 200 V polypropylene film
C511	1-107-256	390 pF 1500 V silvered mica
C512	1-106-029-12	0.001 μF 600 V mylar
C513	1-107-254	270 pF 1000 V silvered mica
C514, 516	1-107-125	56 pF 50 V silvered mica
C515	1-107-244	470 pF 50 V silvered mica

RESISTORS

All resistors are ¼ W and carbon type unless otherwise noted.

Ref. No.	*Part No.*	*Description*
R101, 201 301, 401	1-242-709-09	33 kΩ low noise
R102, 202 302, 402	1-242-739-09	470 kΩ low noise
R103, 203 303, 403	1-242-719-09	82 kΩ low noise
R104, 204 304, 404	1-242-701-09	15 kΩ low noise
R105, 205 305, 405	1-242-682-11	2.4 kΩ
R106, 206 306, 406	1-242-661-11	330 Ω
R107, 207 307, 407	1-242-721-11	100 kΩ
R108, 208 308, 408	1-242-685-11	3.3 Ω
R110, 210 310, 410	1-242-687-11	3.9 kΩ
R111, 211 311, 411	1-242-735-11	390 kΩ
R112, 212 312, 412	1-242-713-11	47 kΩ
R113, 213 313, 413	1-222-770-11	470 Ω (B)
R114, 214 314, 414	1-242-705-11	22 kΩ
R115, 215 315, 415	1-242-665-11	470 Ω
R116, 216 316, 416	1-242-673-11	1 kΩ
R117, 217 317, 417	1-242-707-11	27 kΩ
R118, 218 318, 418	1-242-703-11	18 kΩ
R119, 219 319, 419	1-242-681-11	2.2 kΩ
R120, 220 320, 420	1-242-675-11	1.2 kΩ
R121, 221 321, 421	1-242-675-11	1.2 kΩ
R122, 222 322, 422	1-242-721-11	100 kΩ
R123, 223 323, 423	1-242-719-11	82 kΩ
R124, 224 324, 424	1-242-673-11	1 kΩ
R125, 225 325, 425	1-222-773-11	4.7 kΩ (B) semi-fixed
R126, 226 326, 426	1-242-649-11	100 Ω
R127, 227	1-242-739-11	470 kΩ
R128, 228	1-242-685-11	3.3 kΩ
R129, 229 R329, 429	1-242-735-11	390 kΩ
R130, 230 330, 430	1-242-685-11	3.3 kΩ
R131, 231 331, 431	1-222-772-11	2.2 kΩ (B) semi-fixed

Ref. No.	*Part No.*	*Description*
R132, 232 332, 432	1-242-687-11	3.9 kΩ
R133, 233 333, 433	1-222-715-11	20 kΩ (B); semi-fixed
R134, 234 334, 434	1-242-703-11	18 kΩ
R135, 235 335, 435	1-242-729-11	220 kΩ
R136, 236 336, 436	1-242-717-11	68 kΩ
R137, 237 337, 437	1-242-691-11	5.6 kΩ
R138, 238 338, 438	1-242-681-11	2.2 kΩ
R139, 239 339, 439	1-242-699-11	12 kΩ
R140, 240 340, 440	1-242-723-11	120 kΩ
R141, 241 341, 441	1-222-306-11	20 kΩ (A); variable MIC VOL
R142, 242 342, 442	1-242-673-11	1 kΩ
R143, 243 343, 443	1-242-682-11	2.4 kΩ
R144, 244 344, 444	1-242-681-11	1.5 kΩ
R145, 245 345, 445	1-242-695-11	8.2 kΩ
R146, 246 346, 446	1-242-697-12	10 kΩ
R209, 409	1-242-707-11	27 kΩ
R501	1-242-709-11	33 kΩ
R502	1-242-719-11	82 kΩ
R503	1-222-777-11	100 kΩ (B); semi-fixed
R504	1-242-683-11	2.7 kΩ
R505	1-242-625-11	10 Ω
R506	1-209-204-11	22 Ω
R507, 508	1-242-615-11	3.9 Ω
R509, 510	1-242-709-11	33 kΩ

SWITCHES

Ref. No.	*Part No.*	*Description*
S1-1 ~ 4	1-514-814	slide, INPUT SELECT
S2 - 1 ~ 16	1-514-961	slide, rec/pb, front
S3 - 1 ~ 16	1-514-961	slide, rec/pb, rear
S4 - 1 ~ 6	1-514-867	slide, TAPE SELECT
S5 - 1 ~ 6	1-514-453	slide, playback, equalizer and bias switch front
S6 - 1 ~ 6	1-514-453	slide, playback, equalizer and bias switch rear
S7 - 1 ~ 4	1-514-768	slide, SYSTEM SELECT
S8-1 ~ 4	1-514-869	slide, HEADPHONE
S9-1 ~ 9	1-514-454	slide, record equalizer
S10	1-514-266	leaf, muting, front
S11	1-514-266	leaf, muting, rear
S12	1-514-548	rotary, bias osc
S13	1-514-039	micro, shut-off
S14	1-514-472-21	seesaw, POWER (GEP)
	1-514-655-31	seesaw, POWER (General Export)
	1-514-655-71	seesaw, POWER (USA and Canada)
S15	1-514-512	rotary, frequency change (General Export and GEP)

JACKS

J101 ~ J401	1-507-163	4-P-phono, LINE IN
J102 ~ J402	1-507-251	M-10, miniature; MICROPHONE
J103 ~ J403	1-507-163	4-P-phono, LINE OUT
J501	1-507-282	JM65, M-15; HEADPHONE

HEADS

R PH	8-829-342-40	record/playback, PP138-4204
EH	8-825-527-00	erase, EF 137-2904H

MISCELLANEOUS

CP501	1-231-057-12	encapsulated components, 0.033 μF + 120 (General Export and GEP)
	1-231-057-31	encapsulated components, 0.033 μF + 120 (USA and Canada)
CP502	1-101-534-12	encapsulated components, 0.1 μF + 120 Ω (General Export and GEP)
	1-101-534-31	encapsulated component, 0.1 μF + 120 Ω (USA and Canada)
PL501 ~ 506	1-518-093	lamp, 0.1 A
ME101 ~ 401	1-524-078	meter, level
	1-534-487	cord, power (General Export)
	1-534-538-21	cord, power (USA and Canada)
	1-536-154	terminal strip A type 3L3
M	8-832-624-22	motor, IC-624H
VS	1-509-427	connector, power voltage selector (General Export)
	1-509-482	connector, power voltage selector (GEP)
F	1-532-163	fuse, 0.8A (General Export)
F	1-532-264	fuse, 0.75A (Canada)
F	1-532-063	fuse, 1 A (GEP)
F	1-532-204	fuse, 2 A (GEP)
F	1-532-215	fuse, 0.8 A (GEP)
	1-533-006	holder, fuse; W/cover (General Export)
	1-533-026	holder, fuse (GEP)

SECTION 7
HARDWARE

SCREWS

Part No.	*Description*
7-621-169-52	⊕ R 4 x 25
7-621-209-82	⊕ P 2.6 x 14
7-621-255-19	⊕ P 2 x 3
7-621-255-22	⊕ P 2 x 4
7-621-255-42	⊕ P 2 x 6
7-621-259-22	⊕ P 2.6 x 4
7-621-259-30	⊕ P 2.6 x 5
7-621-259-40	⊕ P 2.6 x 6
7-621-560-22	⊕ K 2.6 x 20
7-621-743-21	⊕ R 3.1 x 10, wood screw
7-682-145-00	⊕ P 3 x 4
7-682-146-01	⊕ P 3 x 5
7-682-147-01	⊕ P 3 x 6
7-682-148-00	⊕ P 3 x 8
7-682-149-01	⊕ P 3 x 10
7-682-161-01	⊕ P 4 x 8
7-682-167-00	⊕ P 4 x 25
7-682-548-00	⊕ B 3 x 8
7-682-551-00	⊕ B 3 x 14
7-682-552-00	⊕ B 3 x 16
7-682-561-01	⊕ B 4 x 8
7-682-645-00	⊕ PS 3 x 4
7-682-646-00	⊕ PS 3 x 5
7-682-647-00	⊕ PS 3 x 6
7-682-648-00	⊕ PS 3 x 8
7-682-652-00	⊕ PS 3 x 16
7-682-661-00	⊕ PS 4 x 8
7-682-947-01	⊕ PSW 3 x 6
7-682-948-01	⊕ PSW 3 x 8
7-682-960-01	⊕ PSW 4 x 6
7-685-145-31	⊕ PS 3 x 6, self tapping
7-685-147-01	⊕ P 3 x 10, self tapping
7-685-158-01	⊕ P 4 x 6, self tapping

WASHERS

Part No.	*Description*
7-623-105-01	W 2 mm dia.
7-623-108-01	W 3 mm dia.
7-623-110-12	W 4, middle t = 0.1
7-623-110-12	W 5, middle t = 0.2
7-623-113-18	W 6, middle t = 0.5
7-623-113-18	W 6, middle t = 0.3
7-623-205-11	SW 2 mm dia.
7-623-207-11	SW 2.6 mm dia.
7-623-208-27	SW 3 mm dia.
7-623-210-28	SW 4 mm dia.
7-623-308-05	W 3, internal tooth

NUTS

Part No.	*Description*
7-622-107-00	2.6 mm dia.
7-684-014-01	4 mm dia.
7-684-033-01	3 mm dia.

RETAINING RINGS

Part No.	*Description*
7-624-104-01	E-2
7-624-106-05	E-3
7-624-108-05	E-4
7-624-109-05	E-5

LUG

Part No.	*Description*
7-623-508-01	3 mm dia.

BOLT

Part No.	*Description*
7-683-323-00	4 x 16, hexagon

—— Hardware Nomenclature ——

P – Pan Head Screw ....

PS – Pan Head Screw with Spring Washer ....

K – Flat Countersunk Head Screw ...

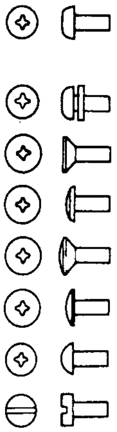
B – Binding Head Screw ....

RK – Oval Countersunk Head Screw ..

T – Truss Head Screw ....

R – Round Head Screw ....

F – Flat Fillister Head Screw ....



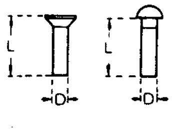
SC – Set Screw .... ⊖

E – Retaining Ring (E Washer) ......

W – Washer
SW – Spring Washer
LW – Lock Washer
N – Nut

– Example –

⊕ P 3x10
Type of Slot
Length in mm (L)
Diameter in mm (D)
Type of Head



4-CHANNEL STEREO TAPECORDER

TC-277-4

US Model
Serial No. 15,501 and later

E Model
Canadian Model
GEP Model
Serial No. 23,801 and later

SUPPLEMENT

No. 1
AUGUST, 1974

This supplement updates the service manual to include production changes.
File this supplement with the service manual.

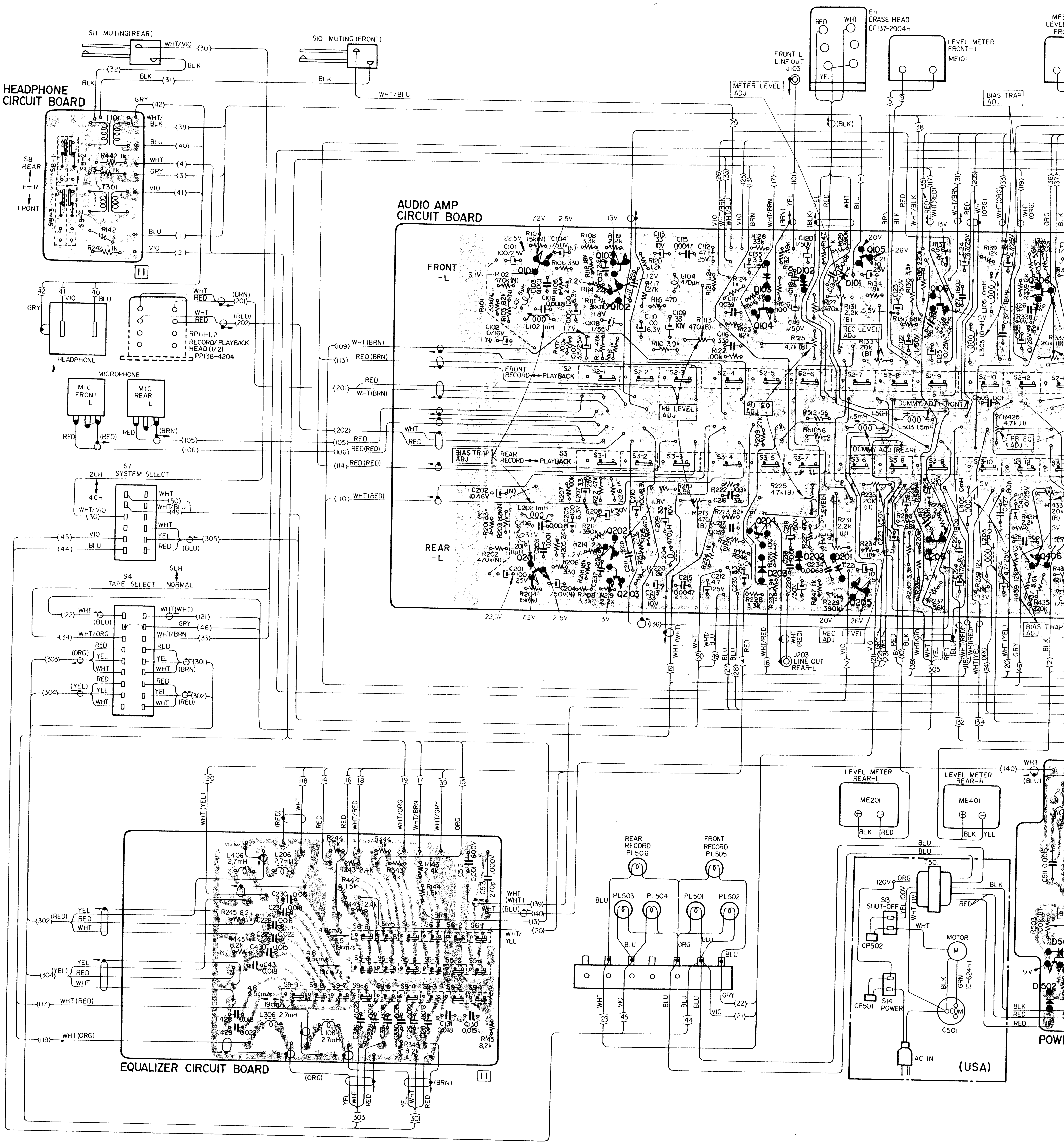
Subject: Changes of Circuit Boards

SONY
SERVICE MANUAL

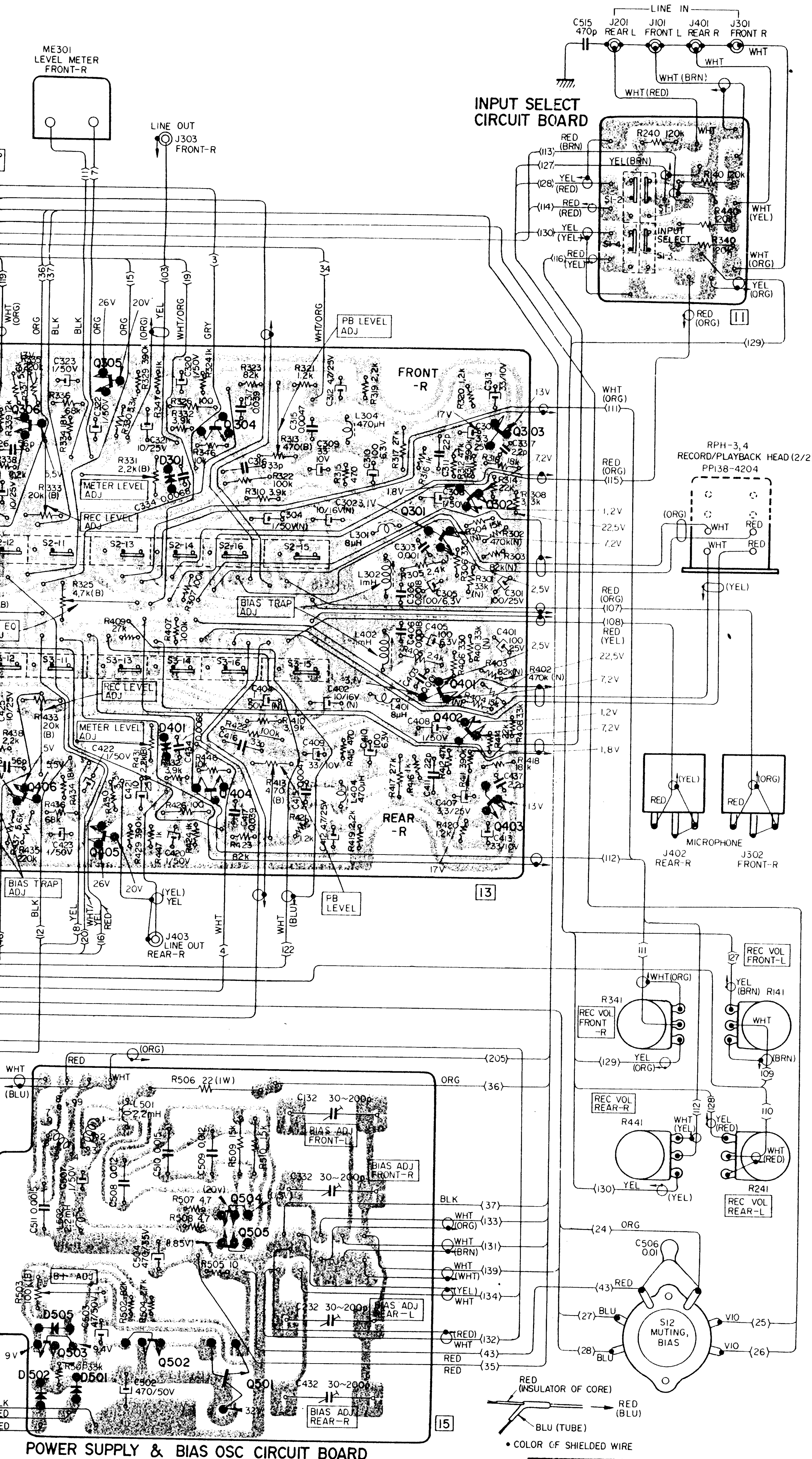
MEMO

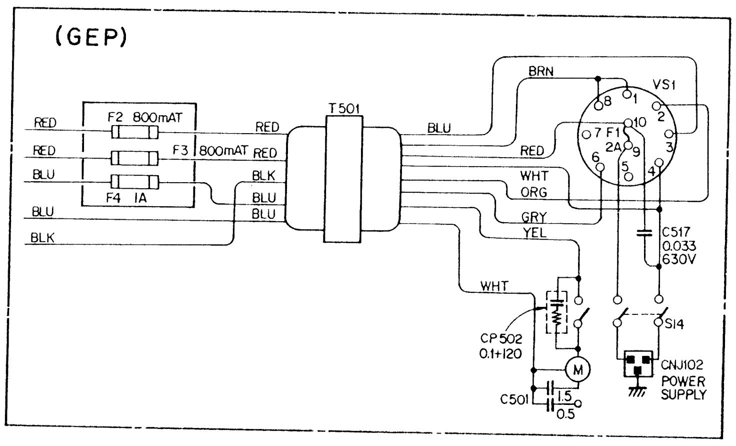
1. MOUNTING DIAGRAM

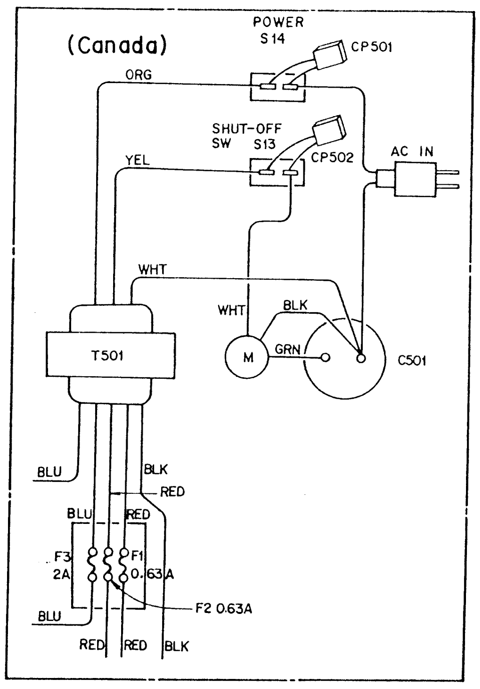
—Conductor Side—

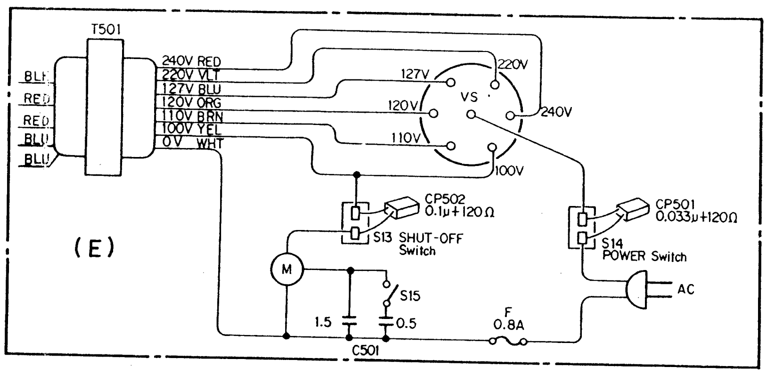

S11 MUTING (REAR)
S10 MUTING (FRONT)
HEADPHONE CIRCUIT BOARD
T101
T301
R442 1k
R342 1k
R142 1k
R242 1k
S8 REAR
F+R
FRONT
HEADPHONE
RPH1-1,2 RECORD/PLAYBACK HEAD (1/2) PP138-4204
MICROPHONE
MIC FRONT L
MIC REAR L
S7 SYSTEM SELECT
2CH
4CH
S4 TAPE SELECT
SLH
NORMAL
EH ERASE HEAD EF137-2904H
FRONT-L LINE OUT J103
METER LEVEL ADJ
LEVEL METER FRONT-L ME101
BIAS TRAP ADJ
AUDIO AMP CIRCUIT BOARD
FRONT -L
REAR -L
FRONT RECORD → PLAYBACK
REAR RECORD → PLAYBACK
PB LEVEL ADJ
PB EQ ADJ
REC LEVEL ADJ
DUMMY ADJ (FRONT)
DUMMY ADJ (REAR)
J203 LINE OUT REAR-L
LEVEL METER REAR-L ME201
LEVEL METER REAR-R ME401
EQUALIZER CIRCUIT BOARD
REAR RECORD PL506
FRONT RECORD PL505
PL503
PL504
PL501
PL502
T501
S13 SHUT-OFF
CP502
S14 POWER
CP501
MOTOR
C501
AC IN
(USA)
WHT
BLK
RED
YEL
BLU
VIO
GRY
ORG
BRN

Q	101 201	103,102 202,203	104 204			105 205	106 206	306,406 503
D			103 203	102 202	101 201			50 502


ME301
LEVEL METER
FRONT-R
LINE OUT
J303
FRONT-R
LINE IN
C515 470p
J201 REAR L
J101 FRONT L
J401 REAR R
J301 FRONT R
INPUT SELECT CIRCUIT BOARD
INPUT SELECT
PB LEVEL ADJ
FRONT -R
REAR -R
METER LEVEL ADJ
REC LEVEL ADJ
BIAS TRAP ADJ
PB LEVEL
RPH-3, 4
RECORD/PLAYBACK HEAD (2/2)
PP138-4204
MICROPHONE
J402 REAR-R
J302 FRONT-R
J403 LINE OUT REAR-R
REC VOL FRONT-L
REC VOL FRONT-R
REC VOL REAR-R
REC VOL REAR-L
BIAS ADJ FRONT-L
BIAS ADJ FRONT-R
BIAS ADJ REAR-L
BIAS ADJ REAR-R
B+ ADJ
S12 MUTING, BIAS
RED (INSULATOR OF CORE)
RED (BLU)
BLU (TUBE)
• COLOR OF SHIELDED WIRE
POWER SUPPLY & BIAS OSC CIRCUIT BOARD


(GEP)
F2 800mAT
F3 800mAT
F4 1A
T501
VS1
C517 0.033 630V
CP502 0.1+120
C501 1.5 0.5
S14
CNJ102 POWER SUPPLY

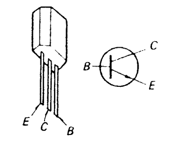

(Canada)
POWER S14
CP501
SHUT-OFF SW S13
CP502
AC IN
T501
C501
F3 2A
F1 0.63A
F2 0.63A


(E)
T501
240V RED
220V VLT
127V BLU
120V ORG
110V BRN
100V YEL
0V WHT
VS
CP502 0.1μ+120Ω
S13 SHUT-OFF Switch
CP501 0.033μ+120Ω
S14 POWER Switch
AC
S15
1.5
0.5
C501
F 0.8A

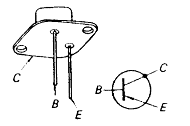
06,406 305,405 304,404 301 302 303
503 502 504,505,501 401 402 403
505 301
502 501 401

$Q_{301,\ 401}^{101,\ 201}$: 2SC632A

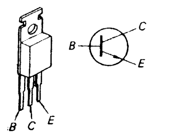
$Q_{302,\ 402}^{102,\ 202}$
$Q_{303,\ 403}^{103,\ 203}$
$Q_{304,\ 404}^{104,\ 204}$: 2SC634A
$Q_{305,\ 405}^{105,\ 205}$
$Q_{306,\ 406}^{106,\ 206}$
Q502, 503



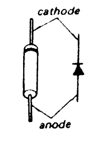
Q501: 2SD291



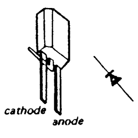
Q504, 505: 2SC1173



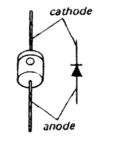
D101, 201
D103, 203: 1T22
D301, 401


cathode
anode

D102, 202 : MZ-09
D503


cathode
anode

D501, 502: 10D-2


cathode
anode

2. ELECTRICAL PARTS

MOUNTED CIRCUIT BOARDS

Ref. No.	Part No.	Description
	X-35100-51-1	Audio Amp
	X-35100-52-1	Power & Bias Osc
	X-35100-53-1	Equalizer Switch
	X-35100-54-1	Headphone Switch
	X-35100-55-1	Input Select Switch

SEMICONDUCTORS

Ref. No.	Part No.	Description	
Q101, 201 Q301, 401		Transistor	2SC632A
Q102, 202 Q302, 402		Transistor	2SC634A
Q103, 203 Q303, 403		Transistor	2SC634A
Q104, 204 Q304, 404		Transistor	2SC634A
Q105, 205 Q305, 405		Transistor	2SC634A
Q106, 206 Q306, 406		Transistor	2SC634A
Q501		Transistor	2SD291
Q502		Transistor	2SC634A
Q503		Transistor	2SC634A
Q504		Transistor	2SC1173
Q505		Transistor	2SC1173
D101, 201		Diode	1T22
D102, 202		Diode	MZ-09
D103, 203		Diode	1T22
D301, 401		Diode	1T22
D501, 502		Diode	10D-2
D503		Diode	MZ-09

COILS

Ref. No.	Part No.	Description
L101, 201 L301, 401	1-407-519-00	Microinductor, 8 μH
L102, 202 L302, 402	1-409-237-00	Trap, 1 mH
L103, 203 L303, 403		---------------
L104, 204 L304, 404	1-407-488-00	Microinductor, 470 μH
L105, 205 L305, 405	1-407-290-00	Inductor, variable; 10 mH
L106, 206 L306, 406	1-407-199-00	Microinductor, 2.7 mH
L501, 502	1-407-198-00	Microinductor, 2.2 mH
L503, 504	1-407-285-00	Inductor, variable; 1.5 mH

TRANSFORMERS

Ref. No.	Part No.	Description
T101, 301	1-427-299-00	Output
T501	1-441-829-00	Power (USA, Canada)
	1-441-877-00	Power (E)
	1-441-924-00	Power (GEP)
T502	1-433-152-00	Bias Osc

CAPACITORS

All capacitors are in μF unless otherwise indicated.
(p = $\mu\mu$, elect = electrolytic)

Ref. No.	Part No.	Description		
C101, 201 C301, 401	1-121-416-11	100	25 V	elect
C102, 202 C302, 402	1-121-916-11	10	16 V	elect
C103, 203 C303, 403	1-106-058-12	0.001	50 V	mylar
C104, 204 C304, 404	1-121-391-11	1	50 V	elect
C105, 205 C305, 405	1-121-413-11	100	6.3 V	elect
C106, 206 C306, 406	1-105-504-12	0.0018	50 V	mylar
C107, 207 C307, 407	1-121-392-11	3.3	25 V	elect
C108, 208 C308, 408	1-121-391-11	1	50 V	elect
C109, 209 C309, 409	1-121-402-11	33	10 V	elect
C110, 210 C310, 410	1-121-413-11	100	6.3 V	elect
C111, 211 C311, 411	1-107-115-11	22 p	50 V	silvered mica
C112, 212 C312, 412	1-121-395-11	4.7	25 V	elect
C113, 213 C313, 413	1-121-402-113	33	10 V	elect
C114, 214 C314, 414	–	---------------		
C115, 215 C315, 415	1-105-509-12	0.0047	50 V	mylar
C116, 216 C316, 416	1-107-119-11	33 p	50 V	silvered mica
C117, 217 C317, 417	1-105-520-12	0.039	50 V	mylar
C118, 218	1-105-520-12	0.01	50 V	mylar
C119, 219	1-121-391-11	1	50 V	elect
C120, 220 C320, 420	1-121-391-11	1	50 V	elect
C121, 221 C321, 421	1-121-398-11	10	25 V	elect
C122, 222 C322, 422	1-121-391-11	1	50 V	elect
C123, 223 C323, 423	1-121-391-11	1	50 V	elect
C124, 224 C324, 424	1-121-395-11	4.7	25 V	elect
C125, 225 C325, 425	1-121-398-11	10	25 V	elect
C126, 226 C326, 426	1-107-125-11	56 p	50 V	silvered mica
C127, 227 C327, 427	1-107-175-11	180 p	500 V	silvered mica
C128, 228 C328, 428	1-106-301-12	0.018	50 V	mylar
C129, 229 C329, 429	1-106-033-12	0.022	50 V	mylar
C130, 230 C330, 430	1-106-029-12	0.015	50 V	mylar
C131, 231 C331, 431	1-106-031-12	0.018	50 V	mylar
C132, 232 C332, 432	1-141-034-11	30 p ~ 200 p		trimmer
C133, 233 C333, 433		---------------		
C134, 234 C334, 434	1-105-671-12	0.0068	50 V	mylar
C135, 235	1-121-392-11	3.3	25 V	elect
C136, 236 C336, 436	1-105-671-12	0.0068	50 V	mylar
C137, 237 C337, 437	1-107-042-11	2.2 p	500 V	silvered mica
C501	1-117-034-11	1.5	250 V	metalized paper (USA, Canada)
	1-117-036-11	1.5 + 0.5	350 V	metalized paper (E, GEP)
C502	1-121-810-11	470	50 V	elect
C503	1-121-411-11	47	50 V	elect
C504	1-121-361-11	470	35 V	elect
C505, 506	1-105-520-12	0.01	50 V	mylar
C507	1-121-396-11	4.7	50 V	elect
C508, 509	1-129-715-11	0.012	630 V	polypropylene
C510	1-129-795-11	0.015	200 V	polypropylene
C511	1-129-704-11	1500 p	630 V	polypropylene
C512	1-106-029-12	0.001	600 V	mylar
C513	1-107-254-11	270 p	1000 V	silvered mica
C514	1-107-125-11	56 p	50 V	silvered mica
C515	1-107-244-11	470 p	50 V	silvered mica
C516	1-107-125-11	56 p	50 V	silvered mica

RESISTORS

All resistors are in Ω. ¼ W, ± 5 %, carbon resistors (except particular type) are omitted. Check the schematic diagram for the resistance values. (k = 1000)

Ref. No.	Part No.	Description		
R101, 201 R301, 401	1-242-709-09	33 k		low noise
R102, 202 R302, 402	1-242-739-09	470 k		low noise
R103, 203 R303, 403	1-242-719-09	82 k		low noise
R104, 204 R304, 404	1-242-701-09	15 k		low noise
R113, 213 R313, 413	1-222-770-11	470 (B)		adjustable
R125, 225 R325, 425	1-222-773-11	4.7 k (B)		adjustable
R131, 231 R331, 431	1-222-772-11	2.2 k (B)		adjustable
R133, 233 R333, 433	1-222-715-11	20 k (B)		adjustable
R141, 241 R341, 441	1-222-306-11	20 k (A), variable; MIC VOL		
R506	1-209-204-11	22	1 W, 10 %	
R511, 512	1-206-481-11	56	2 W	metal oxide

SWITCHES

Ref. No.	Part No.	Description
S1	1-514-814-00	Slide, INPUT SELECT
S2	1-514-961-00	Slide, rec/pb, front
S3	1-514-961-00	Slide, rec/pb, rear
S4	1-514-867-00	Slide, TAPE SELECT
S5	1-514-453-00	Slide, playback; equalizer and bias switch front
S6	1-514-861-21	Slide, playback; equalizer and bias switch rear
S7	1-514-768-00	Slide, SYSTEM SELECT
S8	1-514-869-00	Slide, HEADPHONE
S9	1-514-454-00	Slide, record equalizer
S10	1-514-266-00	Leaf, muting; front
S11	1-514-266-00	Leaf, muting, rear
S12	1-514-548-00	Rotary, bias osc
S13	1-514-039-00	Micro, shut-off
S14	1-514-655-31	Seesaw, POWER (GEP)
	1-514-655-31	Seesaw, POWER (E, US, Canadian)
	1-514-655-71	Seesaw, POWER (USA, Canada)
S15	1-514-512-00	Rotary, frequency change (E, GEP)

HEADS

Ref. No.	Part No.	Description
RPH	8-829-342-40	Record/playback, PP138-4204
EH	8-825-527-00	Erase, EF137-2904H

JACKS

Ref. No.	Part No.	Description
J101, 201 J301, 401	1-507-163-00	4 P phono, LINE IN
J102, 202 J302, 402	1-507-251-00	M-10, mini; MICROPHONE
J103, 203 J303, 403	1-507-163-00	4 P phono, LINE OUT
J501	1-507-282-00	JM65, M-15; HEADPHONE

MISCELLANEOUS

Ref. No.	Part No.	Description
CP501	1-231-057-00	Encapsulated Component, C-R 0.033 μF + 120 Ω (E, GEP)
	1-231-057-31	Encapsulated Component, C-R 0.033 μF + 120 Ω (USA, Canada)
CP502	1-101-534-12	Encapsulated Component, C-R 0.1 μF + 120 Ω (E, GEP)
	1-101-534-31	Encapsulated Component, C-R 0.1 μF + 120 Ω (USA, Canada)
PL501 ~ 506	1-518-093-11	Lamp, 0.1 A
ME101 ~ 401	1-524-078-11	Meter, level
M	8-832-624-09	Motor, IC-624H1
VS	1-509-427-00	Connector, power voltage selector (E)
	1-509-482-00	Connector, power voltage selector (GEP)
F1	1-532-163-00	Fuse, 0.8 A (E)
	1-532-263-XX	Fuse, 0.63 A (Canada)
F2	1-532-215-00	Fuse, 800 mAT (GEP)
	1-532-263-XX	Fuse, 0.63 A (Canada)
F3	1-532-215-00	Fuse, 800 mAT (GEP)
	1-532-268-XX	Fuse, 2 A (Canada)
F4	1-532-063-00	Fuse, 1 A (GEP)
	1-533-006-01	Holder, fuse; w/cover (E)
	1-533-026-31	Holder, fuse (GEP)
	1-534-487-00	Cord, power (E)
	1-534-538-21	Cord, power (USA, Canada)
	1-536-154-00	Terminal Strip, A type 3L3